

**Revised PCB Sampling Plan
for the
SS United States
Pier 82
Philadelphia, Pennsylvania**

Prepared For:
SS United States Conservancy &
USEPA Region 3

Prepared By:



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1.0 INTRODUCTION

1.1 Purpose of the Sampling Plan

This Sampling Plan (Plan) has been developed to address the possible presence of polychlorinated biphenyls (PCBs) aboard the SS United States. ATC Associates Inc. (ATC) has developed this Sampling Plan to evaluate PCBs on board the vessel utilizing pertinent information from the US Maritime Administration (MARAD) and the US Environmental Protection Agency (EPA) guidance documents “Sampling Ships for PCBs Regulated for Disposal (Interim Final Policy)”, dated November 30, 1995, and Compliance with the TSCA PCB Disposal Regulations: Sampling and Analyzing Paint on Metal Surfaces of Vessels Being Scrapped for Metal Recovery. ATC realizes that the above policies and guidance documents were developed for vessels destined for scrapping, not for re-use, but they do provide relevant information for the development of the plan. In addition, ATC has incorporated the applicable comments presented by EPA in their January 24, 2011 email.

1.2 Organization of the Sampling Plan

This Sampling Plan is organized into seven (7) sections as follows:

Section 1.0	Introduction
Section 2.0	Completed Materials Survey
Section 3.0	Proposed Sampling
Section 4.0	Analytical Methods
Section 5.0	Quality Assurance/Quality Control (QA/QC) Program
Section 6.0	Data Evaluation
Section 7.0	Site Specific Health and Safety Plan

Section 1.0 describes the purpose and organization of the Sampling Plan, provides a summary description and history of the project. Section 2.0 describes the Materials Survey conducted and the subsequent anticipated sample count determination for the materials identified. Descriptions of sampling frequencies are found in Section 3.0. Section 3.0 also describes the field sampling techniques. Section 4.0 describes the analytical techniques to be used. Section 5.0 describes the quality assurance requirements for the sampling event. Descriptions of how field data will be interpreted and reported are found in Section 6.0. Finally, the Health and Safety Plan is identified in Section 7.0.

1.3 Site History

The luxury liner SS United States, “The Nation’s Flagship”, is the largest passenger liner ever built in the United States, measuring in at nearly 1,000 feet long and weighing in at over 53,000 gross tons. She was built at the Newport News Shipbuilding and Dry Dock Company in Virginia for The United States Line and sailed the Atlantic from New York to England from 1952 to 1969. She set the trans-Atlantic crossing record on her maiden

voyage (3 days, 10 hours, 40 minutes), winning her the Blue Riband. That record still stands after nearly 60 years.

Upon retirement from active service in 1969, a victim of trans-Atlantic jet service, “Big U” was hermetically sealed and maintained by the US Navy until 1978. Since then she has had several private owners, all of whom intended to return her to service. In 1984 most of her interior fittings and furniture were sold at auction. In the 1990’s she was sent to Turkey where she was gutted and where most of her asbestos was reportedly removed.

In 1996 she was brought to Philadelphia’s Pier 82 on the Delaware River, where she remains to this day. In 2004 she was purchased by Norwegian Cruise Lines (NCL). In July 2010, H. F. “Gerry” Lenfest of Philadelphia pledged up to \$5.8 million to the SS United States Conservancy (SSUSC) to acquire her from NCL. On February 1, 2011, the SSUSC successfully completed the purchase. As part of the restoration plan and in advance of the sale to The Conservancy, ATC was contracted to prepare and execute a sampling plan to identify materials which may potentially contain polychlorinated biphenyls (PCBs). PCBs were once used in fluids used to cool electrical equipment, due to their fire-resistant properties, and were also found in gaskets, insulation, paints, and a host of other manufactured materials. Once identified, ATC will develop a plan to manage those materials in an environmentally sound manner.

The SSUSC’s plan for the SS United States (SSUS) is to develop a private-public partnership which will restore her to use as a stationary waterfront attraction, most likely in New York City or Philadelphia. Depending upon the location, plans may include a floating museum and/or entertainment venue.

1.4 Site Description

The SS United States consists of the following twelve (12) decks, which are described below from bow (front of ship) to stern (rear of ship). It should be noted that in the mid 1980s the majority of the interior fittings were removed and in the 1990s the ship was gutted. The descriptions below detail the former area designations on each deck:

Navigating Bridge Deck

The Navigating Bridge Deck contained such areas as the wheel house, chart room, damage control room, radar/transmission room, elevator penthouses, fan rooms, tourist class sheltered deck, supply plenums, emergency generator room, and the tourist open deck.

Sports Deck

The Sports Deck contained such areas as the master’s quarters, the executive officer’s quarters, the master reception room, officers’ quarters, officers’ lounge, radio room, radio office, dog house and run, first class deck, fan room, engineers’ and officers’ mess, pantries, first class children’s play room, battery room, electrical room and the first class game deck.

Sun Deck

The Sun Deck contained such areas as the penthouse, first class lodgings, first class ball room, pantries, junior engineers' quarters, motion picture booth, crew quarters and the working deck.

Promenade Deck

The Promenade Deck contained such areas as the crew's open promenade, fan rooms, winch control room, open promenade, tourist lounge, tourist class theater, observation lounge, first class main entrance, first class ballroom, first class cocktail lounge, first class restaurant and associated pantry, first class smoking room and tobacco shop, shopping center, bar, first class and cabin class theater, electrical workshop, emergency generator, aft fan rooms and filter cleaning room, radiator rooms, raised promenade, and the aft steering station.

Upper Deck

The Upper Deck contained such areas as anchor handling area, crew quarters (seaman, etc.), tourist class rooms, tourist class children play room, tourist class beauty and barber shops, first class rooms, telephone operator rooms, first class pantries, cabin class rooms, novelty shop, cabin class lounge, cabin class covered deck, and the cabin class open promenade deck.

Main Deck

The Main Deck contained such areas as the upholstery and carpenters shops, windlass motor room, crew quarters (boson mates, carpenter mates, etc.), fan rooms, electric station, tourist class purser offices, tourist smoking room, tourist class rooms, first class purser offices, first class rooms, first class dining saloon, battery room, telephone room, first class pantries, more first class rooms, beautician rooms, cabin class smoking room, more fan rooms, deck and engine recreation rooms, and the crews covered promenade.

"A" Deck

The "A" Deck contained such areas as the forward stores, crew quarters (yeomen, stewards, etc.), tourist class rooms, tourist dining saloon, tourist class galley, first class dining saloon, first class galley, cabin class dining saloon, cabin class rooms, crew quarters (cooks, etc.) and the capstan room.

"B" Deck

The "B" Deck contained such areas as the forward stores, crew quarters (bell captain, bell boys, etc.), sick bay, house keeping, tourist class rooms, top of the forward boiler room, top of the forward engine room, crew messes, working spaces, print shop, electrical station, top of the after boiler room, fan room, top of the after engine room, more crew quarters, gymnasium, cabin class rooms, and more crew quarters.

"C" Deck

The "C" Deck contained such areas as the forward stores, chain locker, night crew quarters, tourist class rooms, more crew quarters, middle of the forward boiler room, middle of the forward engine room, port and starboard fuel oil tanks, crew quarters

(firemen, etc.), refrigerated storage, more crew quarters (plumbers, etc.), middle of the after boiler room, middle of the after engine room, port and starboard fuel oil tanks, after auxiliary machine space, swimming pool, baggage room, mail room, utility rooms, and the steerage gear room.

“D” Deck

The “D” Deck contained such areas as crew quarters, tourist class rooms, forward fuel oil settling tanks, middle of the forward boiler room, middle of the forward engine room, port and starboard fuel oil tanks, forward auxiliary machinery space, bulk stores, laundry services, after fuel oil settling tanks, middle of the after boiler room, middle of the after engine room, port and starboard fuel oil tanks, after auxiliary machinery space, after emergency pump room, shaft alley, baggage room, and the mail room.

“E” Deck

The “E” Deck was referred to as a “tween” deck and was not a full deck. The “E” Deck was located in the forward portion of the ship. The deck contained such areas as cargo space, stores and baggage space, potable water tanks, slop oil tank, and forward fuel oil settling tanks.

Inner Bottom Deck

The Inner Bottom Deck or the Hold contained such structures as the ballast tanks, fuel oil tanks, bottom of the forward boiler room, bottom of the forward engine room, forward auxiliary machinery space, storage (fruits, vegetables, beer, etc.), clean linen storage, bottom of the after boiler room, bottom of the after engine room, after auxiliary machinery space, shaft tunnels, baggage room, mail room and other ballast tanks.

2.0 COMPLETED MATERIALS SURVEY

ATC conducted a visual assessment of possible PCB-containing materials during the PCB Baseline Air Monitoring on June 7th, 8th, 9th and 10th, 2011 and following the PCB Baseline Air Monitoring on June 20th, 21st, 23rd, and 27th. The assessment was conducted to accurately identify the type and location of materials for sampling. Prior to conducting the materials survey, ATC reviewed the report of the EPA's Toxic Substances Control Act (TSCA) Section 6(e) PCB (Sampling) Inspection of the SS United States (inspection dates December 14-17, 2009).

2.1 *Survey Process*

The survey was completed in two (2) phases to address the nature of the decks. The first phase included the eight (8) upper decks (Navigation Deck down to "B" Deck) which took into account the wide open nature of these decks, dividing them into quadrants for the purpose of the survey. The second phase included the remaining four (4) lower decks ("C" Deck down to the Hold [Inner Bottom Deck]) which took into account the more compartmentalized nature of these decks, dividing them into sections between bulkheads. Individual deck drawings and their divisions can be found in **Appendix A**.

2.2 *Survey Results*

The visual survey identified the following main material groups that may contain PCBs:

- wire;
- paints (interior and exterior);
- gaskets;
- caulk;
- gasket fabric;
- sealant;
- miscellaneous rubber items;
- flooring materials;
- oils and greases (including stained areas for wipe samples);
- water tight door (WTD) gear covers;
- insulation; and,
- fluorescent light fixtures.

It should be noted that ATC designated an alphabetical naming system to designate the various sizes/types of wires observed throughout the ship. ATC measured the wires using a caliper to confirm varying wire sizes/types. The designations can be seen in the Wire Table on the next page as well as in the tables and photograph key in **Appendix A**.

Tables detailing the locations identified as containing the wire, paints and materials found in the various quadrants on the upper decks and in the various sections between

bulkheads on the lower decks can be found in **Appendix A**. A photograph key can also be found in **Appendix A**.

2.3 Proposed Number of Samples

Based on discussions between ATC, the SSUSC and the EPA, ATC proposes to collect samples of potential PCB containing materials (as described above in the bulleted list) in 10% of the areas on the upper and lower decks identified as containing each material.

For example, the survey identified Wire Type A as being present in all four (4) quadrants of the upper decks:

8 Upper Decks x 4 Quadrants per Deck = 32 Areas containing Wire Type A.

Therefore, 10 % of the Upper Deck Quadrants containing Wire Type A = 3 Quadrants.

The survey further identified Wire Type A being present all in 57 sections of the 4 lower decks:

Then 10% of the Lower Deck Sections containing Wire Type A = 6 Sections.

3 Upper Deck Quadrants plus 6 Lower Deck Sections = 9 Areas.

In addition, in order to account for limitations such as poor lighting, missed materials, etc., during the survey process, ATC will increase the total number of anticipated samples to the nearest increment of 5. Therefore, if 9 Areas were identified to be sampled, we would round up to 10 Anticipated Samples (not including duplicates, matrix spikes, etc. that will be included for laboratory QC).

The following tables summarize the anticipated number of samples ATC proposes to collect based on areas identified as containing each type of material. It should be noted that in the Upper and Lower Deck divisions, in situations where 10% of identified areas results in 1 sample being calculated to be sampled, ATC rounded up to 2 samples being collected to be more representative of the ship's contents.

Wire

Wire Designation	Wire Size	Upper Deck 10% of Areas Observed	Lower Deck 10% of Areas Observed	Total 10 % of Areas Observed	Anticipated # Samples
Type A	11 mm (unpainted) 12-13 mm (painted)	3	6	9	10

Wire Designation	Wire Size	Upper Deck 10% of Areas Observed	Lower Deck 10% of Areas Observed	Total 10 % of Areas Observed	Anticipated # Samples
Type B	14-15 mm (painted)	3	6	9	10
Type C	17-18 mm (painted)	3	6	9	10
Type D	20 mm (painted)	3	2	5	5
Type E	23-24 mm (painted)	3	2	5	5
Type F	28-29 mm (painted)	3	2	5	5
Type G	30 mm (painted)	3	2	5	5
Type H	40 mm (unpainted) 42 mm (painted)	3	2	5	5
Type I	48 mm (painted)	3	2	5	5
Type J	53 mm (painted)	3	2	5	5
Type K	66 mm (painted)	3	2	5	5
Type L	9 mm (painted)	3	6	9	10
Type M	35 mm (painted)	3	2	5	5
Type O	37 mm (painted)	3	2	5	5
Type P	45 mm (painted)	2	2	4	5
Type Q	6 mm (painted)	3	0	3	5
Elevator Control Panel	Not measured	2	0	2	5
Fan Room Control Panel	Not measured	2	0	2	5
		10% TOTAL UPPER AREAS	10% TOTAL LOWER AREAS	10% TOTAL SHIP AREAS	TOTAL ANTICIPATED SHIP SAMPLES
		51	46	97	110

Please note that the SSUSC is considering entering into a contract to have the wiring removed from the ship for purposes of metals reclamation. If the SSUSC decides to take that action, the portion of this sampling plan addressing wiring may have to be modified to take into account how the vendor implementing such a project plans on characterizing and managing the wire (including the disposal of any non-metallic components of the wire in accordance with applicable regulations). The SSUSC has informed ATC that the plans for any such project would be presented to EPA.

Paint

Paint Designation	Upper Deck 10% of Areas Observed	Lower Deck 10% of Areas Observed	Total 10 % of Areas Observed	Anticipated # Samples
Exterior Yellow	2	0	2	5
Exterior White	2	0	2	5
Exterior Red	2	6	8	10
Exterior Black	2	0	2	5
Exterior Silver	2	0	2	5
Interior Yellow	3	2	5	5
Interior White	3	4	7	10
Interior Red	2	2	4	5
Interior Black	2	2	4	5
Interior Silver	2	2	4	5
Interior Pink	2	0	2	5
Interior Gold	2	0	2	5
Interior Blue	2	2	4	5
Interior Green	2	0	2	5
Interior Tan	2	0	2	5
Interior Gray	2	2	4	5
Interior Light Blue	1 ^{Note 1}	2	3	5
Interior Light Green	2	0	2	5
Interior Brown	2	0	2	5
	10% TOTAL UPPER AREAS	10% TOTAL LOWER AREAS	10% TOTAL SHIP AREAS	TOTAL ANTICIPATED SHIP SAMPLES
	39	24	63	105

Note 1- Only 1 sample collection location was identified

Other Materials

Material Designation	Upper Deck 10% of Areas Observed	Lower Deck 10% of Areas Observed	Total 10 % of Areas Observed	Anticipated # Samples
Water Tight Door (WTD) Gasket	3	2	5	5
Porthole Gasket	3	0	3	5
WTD Hatch Gasket	2	0	2	5
Window Gasket	2	0	2	5
WT Light Gasket	2	2	4	5
Electric Box Gasket	2	0	2	5
Elevator Door Gasket	3	2	5	5
Refrigerator Door Gasket	0	2	2	5
Melted Gasket	1 ^{Note 1}	0	1	1
Dust Filter Rubber Gasket	2	0	2	5
Vent Gasket Fabric	2	0	2	5
Black Sealant	2	0	2	5
White Caulk	1 ^{Note 1}	0	1	1
Porthole Caulk	3	0	3	5
Window Caulk	2	0	2	5
Noise Bushing	2	0	2	5
Life Boat Rubber Mount	1 ^{Note 1}	0	1	1
Rubber Stops	2	2	4	5
Rubber Push Buttons	2	2	4	5
4x4 Floor Tile	2	2	4	5
9x9 Floor Tile	2	2	4	5
12x6 Floor Tile	2	0	2	5
12x12 Floor Tile	2	2	4	5
15x15 Floor Tile	2	0	2	5
15x15 with Small Center Circle Floor Tile	2	0	2	5
15x15 Black with Open White	2	0	2	5

Material Designation	Upper Deck 10% of Areas Observed	Lower Deck 10% of Areas Observed	Total 10 % of Areas Observed	Anticipated # Samples
Squares at Corners Floor Tile				
Blue with Big White Circle Flooring	2	0	2	5
Red with Tan Stripes Flooring	2	2	4	5
Black with 2 Thin White Stripes Flooring	2	0	2	5
Sheet Floor Covering	2	1 ^{Note 1}	3	5
Green Deck Coat	2	0	2	5
Oil Stain (Wipe)	2	2	4	5
Liquid Oil	2	2	4	5
Elevator Machine Oil (Wipe)	2	2	4	5
Grease	2	2	2	5
WTD Gear Covers	2	1 ^{Note 1}	3	5
Insulation	2	2	4	5
Cork Insulation	2	3	5	5
Pipe Wrap / Insulation	0	2	2	5
Fluorescent Lights	N/A – if not labeled “Non- PCB”, assumed to be PCB containing	N/A – if not labeled “Non- PCB”, assumed to be PCB containing	0	0
	10% TOTAL UPPER AREAS	10% TOTAL LOWER AREAS	10% TOTAL SHIP AREAS	TOTAL ANTICIPATED SHIP SAMPLES
	75	37	112	183

Note 1 - Only 1 sample collection location was identified

3.0 PROPOSED SAMPLING

This portion of the Plan provides the sampling and analytical specifications required to implement the sampling program. As indicated in Section 1.3 of this Plan, the SSUS consists of eleven (11) full decks and one (1) “tween” deck for a total of twelve (12) decks. The sampling effort will consist of three (3) phases:

Phase 1	Preliminary Activities
Phase 2	Sampling
Phase 3	Decontamination Procedures

3.1 *Phase 1 - Preliminary Activities*

Preparation for the sampling event can be divided into four (4) primary areas:

1. Sampling Personnel Requirements
2. Logistics
3. Field Equipment Preparation
4. Laboratory Coordination

3.1.1 Sampling Personnel Requirements

Sampling personnel must be properly trained and experienced in the collection, handling and analysis of environmental samples. Sampling personnel must be familiar with all equipment required to collect a representative sample of each material sampled. Sampling personnel must also meet the training requirements of Subpart H 29 Code of Federal Regulations (CFR) Part 1910.120(e).

3.1.2 Logistics

Prior to mobilizing, ATC will arrange access to the ship through Atlantic Logistics. Before commencing activities on board the ship, the sampling personnel will review the available ship drawings to familiarize the team with each deck of the ship. As discussed earlier, the eight (8) upper decks (Navigation Deck down to “B” Deck) will be divided by bisecting the ship from bow to stern and then by mid-deck resulting in four (4) quadrants per deck: forward port, forward starboard, aft port and aft starboard. The four (4) lower decks (“C” Deck down to the Hold) will be divided into sections between bulkheads. Once each deck has been divided, areas that have been identified to contain or to have contained PCB containing materials will be identified and marked on the drawings on a deck by deck basis based on ATC’s earlier observations during the visual survey. Copies of the marked up ship drawings will be supplied to all ATC sampling personnel.

3.1.3 Field Equipment Preparation

All equipment to be used in the sampling effort will be checked and certified fit for service before mobilizing. Any maintenance or cleaning will be completed prior to mobilizing to the ship for sampling.

3.1.4 Coordination with Laboratory

The Sr. Project Manager will insure that the laboratory is prepared to receive samples on the required schedule before collecting any samples. The laboratory will be notified of each sample shipment so that samples can be expeditiously unpacked, inspected, and entered into the analytical flow at the laboratory.

Once these coordination activities are completed, ATC will mobilize to the ship to begin the sampling activities.

3.2 Phase 2 - Sampling

Upon mobilizing to the ship and prior to collecting any samples, sampling personnel will familiarize themselves with the ship by conducting a visual inspection of each deck, starting on the Navigating Bridge Deck and ending at the Hold (Inner Bottom Deck). During this ship-wide inspection, each of the above specified quadrants (upper decks) and sections (lower decks) will be identified and clearly delineated for all members of the sampling team through the use of survey tape, spray paint or other visual markers. It should be noted that a portion of the quadrant and section labeling was completed during ATC's materials survey in June 2011.

3.2.1 Field Documentation / Field Logs

A bound field log book will be maintained to record the following information:

- Sample Number;
- Date, time of sampling;
- Location and identification of each sampling point; and
- Field observations.

3.2.2 Sample Collection

Samples will be collected as follows:

Non-Liquid Samples – Samples include such materials as cable sheathing, insulation, gaskets, etc. Bulk solid sampling typically includes removing a small portion of the potentially contaminated material for analytical testing. Approximately 1 square inch or 30 grams

of material will be collected per sampling point. See attached Standard Operating Procedure (SOP) for further details.

- Paint Samples – Each sample will be scraped from an area of at least 2 inches (in.) by 2 in. including all paint from the outer surface to bare metal. A minimum of 5 grams of material will be collected per sampling point. See attached SOP for further details.
- Liquid Samples – A minimum of 200 milliliters (mL) to a maximum of 1 Liter (L) will be collected per sampling point. See attached SOP for further details.
- Wipe Sample (Liquid on Surface) - The standard wipe area will be 100 square centimeters (cm²) [15.5 square inches]. The wipe pads will be prepared by placing the 100% cotton sterile gauze pads into the wide-mouth glass jar with gloved hands or forceps and saturating with hexane. The area to be sampled will be marked with pencil or a non-interfering tape (e.g., masking tape) using a decontaminated template or disposable template. With straight, even strokes, the pad will be drawn across the area, slightly overlapping each stroke. The wiping begins at the upper left corner and follows a clockwise direction around the perimeter. After wiping the surface, the potentially contaminated side of the swab is folded inward and placed in an 8 ounce (oz.) glass jar with Teflon lined lid using either gloved hand or forceps. See attached SOP for further details.

Copies of detailed SOPs for each sample collection procedure can be found in **Appendix B**.

3.2.2.1 - Sample Containers and Preservation Requirements

Sample containers will consist of the following:

- Non-Liquid Samples – One (1) 8 oz. glass jar with Teflon lined lid.
- Paint Samples – One (1) 8 oz. glass jar with Teflon lined lid.
- Liquid Samples – One (1) liter (L) glass jar with Teflon lined lid.
- Wipe Samples (Liquid on Surface) – One (1) gauze pad soaked with pesticide grade hexane placed in an 8 oz. glass jar with Teflon lined lid.

The sample containers will be pre-preserved as follows:

Non-Liquid Samples –	None; Keep cool
Paint Samples –	None; Keep cool
Liquid Samples –	None; Keep cool
Wipe Samples (Liquid on Surface) –	None; Keep cool

3.2.3 Sample Handling

As an essential part of project management, sample control procedures have been established to ensure sample integrity. All sample containers and samples will be maintained under strict custody procedures throughout the investigation.

3.2.3.1 - Sample Identification

Each sample, including quality control samples, will be identified with a unique sample number. This number will provide easy identification of the sample in field logs, field data sheets, analytical reports, chain-of-custody forms, and project reports. The sample numbering system for PCB samples under this project is divided into 5 parts. A typical PCB sample for this project will have the following nomenclature:

DN - QUAD or SECT - AREA or ROOM – MATERIAL - XXX,

where:

DN:	This identifier represents the Deck Name
QUAD or SECT:	This identifier represents the Quadrant (Upper Decks) or Bulkhead Section (Lower Decks)
AREA or ROOM:	This identifier represents the localized area description or room (where identifiable, based on deck drawings)
MATERIAL:	This identifier represents the wire, paint, or material type
XXX:	Three-digit numerical identifier representing the next available consecutive number starting at 001.

The objective of this system is to provide a unique numbering system that is clearly understandable to project personnel. Sample number and corresponding sample information such as site name, sampling date, and sample location will be kept in a sample log.

Each container will be labeled by the sampler to avoid any possibility of sample misidentification. At a minimum, each label will contain the following information:

- Sample Identification (ID)
- Date and Time
- Sample Analysis
- Sampler's Name/Initials
- Project Name
- Analysis

Upon arrival at the analytical laboratory, each sample will be assigned a unique laboratory ID number that will be used for analysis assignment, sample tracking, and data reporting.

3.2.3.2- Sample Custody

Samples collected for analysis on each sampling day will be considered under custody if:

1. They are in possession, or
2. They are in view, after being in possession, or
3. They were in possession and were locked up or sealed in a tamper-proof manner, or
4. They are placed in a designated secure area.

3.2.3.3- Sample Custody Procedures

1. Each sample collected for the investigation will be entered on a chain-of-custody record.
2. The original chain-of-custody record will accompany the sample containers during transport to document their custody.
3. When custody is relinquished to a common parcel carrier for delivery to the laboratory, the following protocol will be followed:
 - The original chain-of-custody record will be placed inside the shipping package.
 - The shipping package will be sealed with strapping tape and a custody seal affixed. The seal will be placed on the package in such a manner that the package cannot be opened without breaking the seal. The seal shall be signed and dated by the field investigator. The seal will serve to document that the samples remained unaltered during shipment through the common parcel carrier.
4. The laboratory will assume custody of the samples upon receipt and a designated sample custodian will be charged with sample care and receipt. All samples will be logged in a bound, volume-numbered custody log book or an electronic laboratory information management system (LIMS).

5. The laboratory will retain custody of the samples in a secure area until such time as the samples are destroyed. Raw samples will be retained for 30 days subsequent to the date the final report is generated; sample extracts for organics will be retained for 30 days and inorganic digestates will be retained for 180 days subsequent to the report date.
6. The following information must be supplied to complete the chain-of-custody record:
 - Project name.
 - Signature of samplers.
 - Sampling station number, date and time of collection, grab or composite sample designation, and brief description of the type of sample and sampling location.
 - Signatures of individuals involved in sample transfer, i.e., relinquishing and accepting samples. Individuals receiving the samples shall sign, date, and note the time that they received the sample on the form.
 - The type of carrier service will be indicated along with tracking number.
 - The total number of sample containers must be listed in the indicated space for each sample.

3.2.3.4- Sample Shipment Procedures

All samples for chemical analysis will be packaged in shipping containers for overnight delivery to the analytical laboratory. Sample packaging and shipping procedures are listed below.

1. Each container will be checked for a properly completed sample ID label.
2. Each sample container will be placed in a separate plastic bag, then sealed. Allow sufficient headspace in all bottles to compensate for any pressure and temperature changes (approximately 10 percent volume). Be sure lids on all bottles are tight.
3. A large capacity cooler, or specific laboratory prepared sample container will be used to ship the samples. Each cooler will have the drain plug taped shut (inside and out) and will have a plastic bag inserted inside. Approximately 1 to 2 inches of packing material (asbestos-free vermiculite, perlite, or Styrofoam beads or bubble wrap) will be placed in the bottom of the liner.
4. Sample bottles will be placed in the shipping container and secured with packing material as required.
5. Samples for organic and inorganic analyses will be maintained at 4 degrees centigrade during shipment. Either "blue ice" or ice that has been placed in heavy duty polyethylene bags and properly sealed will be used to cool the samples.
6. Additional packing material will be added as needed to fill void space. After all sample containers are packed, the bag will be taped closed.
7. The chain-of-custody record will be placed in a plastic bag, sealed, and taped to the inside of the shipping container lid. The cooler or shipping container will be taped closed with strapping tape.

8. One signed and dated custody seal will be placed across each edge of the shipping container that can be opened. The cooler will be marked "THIS END UP" with arrow labels indicating proper position.
9. The cooler will be relinquished to the courier with the required signed and dated hand bill.

3.3 Decontamination (Decon) Procedures

Non-disposable sampling equipment, will be decontaminated between uses at each sample location in the following manner:

- Wipe the used equipment with a disposable towel soaked with hexane;
- Spray the equipment with a mixture of soap and water and wash with a scrub brush;
- Rinse the equipment a second time with clean water;
- Air dry; and
- Wrap decontaminated equipment in aluminum foil (shiny side out) for storage and transportation.

4.0 ANALYTICAL METHODS

4.1 *Analytical Methods*

Per EPA's request, EPA Method 3540C – Soxhlet Extraction of Solids will be used to extract the sample prior to analysis and EPA Method 8082A will be used to analyze for PCBs.

The following table summarizes the methods to be used:

Analytical Parameter	Analytical Method
Soxhlet Extraction of Solids	EPA Method 3540C
PCB Analysis	EPA Method 8082A

In accordance with correspondence from the EPA on December 20, 2010, all data will be reported using Level 2 Data Package documentation.

Copies of the laboratory Standard Operation Procedures (SOPs) / Methods can be found in **Appendix C**.

5.0 QUALITY ASSURANCE/QUALITY CONTROL (QA/QC) PROGRAM

5.1 Introduction

This Quality Assurance/Quality Control (QA/QC) Program presents guidelines and specifications which describe the Quality Assurance program for PCB sampling aboard the SS United States. The overall objective of the QA/QC Program is to insure that the analytical results are reliable, reproducible, accurate, and complete.

5.2 Project Organization

Project organization is summarized in the following three (3) sections.

5.2.1 SS United States Conservancy (SSUSC) Personnel

The following is a list of key SSUSC project personnel:

Executive Director
Daniel J. McSweeney
SS United States Conservancy
PO Box 32115
Washington, DC 20007

Counsel
Christopher Bell
Sidley Austin LLP
1501 K Street, N.W.
Washington, DC 20005

5.2.2 Atlantic Logistics

Access Coordinator
Nick Manzi
Atlantic Logistics, Inc.
115 Chestnut Street
Philadelphia, PA 19106
Phone: 267-528-1990 x4444
Fax: 267-528-1994
Email: nmanzi@logatl.com

5.2.3 ATC Personnel

The following is a list of key ATC personnel:

Sr. Project Manager
Christopher J. Candela
ATC Associates, Inc.
920 Germantown Pike

Project Manager
Amanda G. Lofink
ATC Associates, Inc.
920 Germantown Pike

Suite 200
Plymouth Meeting, PA 19462
Phone: 610.313.3100 ext. 495
Fax: 610.313.3151
Email: chris.candela@atcassociates.com

Suite 200
Plymouth Meeting, PA 19462
Phone: 610.313.3100 ext. 247
Fax: 610.313.3151
Email: amanda.lofink@atcassociates.com

5.2.4 Laboratory Personnel

The following is a list of key laboratory personnel:

Analytical Laboratory Coordinator

Dr. Kesavalu Bagawandoss
Accutest Houston
10165 Harwin Drive
Houston TX 77036
Phone: 713-271-4700 (office)
281-610-8395 (mobile)
Email: Drdoss@Accutest.com

5.3 *Quality Control Checks*

5.3.1 Field Quality Control Samples

The frequency of field quality control samples for each parameter will be as follows:

5.3.1.1 Equipment Blanks

One (1) equipment blank from used sample collection equipment after it is deconned will be collected for each batch of 20 samples that utilize the equipment. If more than one type of equipment is used to obtain samples, an equipment blank will be collected for each type of equipment.

5.3.1.2 Trip Blanks

One (1) trip blank will be submitted for each sample episode (sample day). The trip blank will consist of ultrapure reagent grade water poured into 40 mL glass vials. Trip blanks are filled at the laboratory, sealed, transported to the sampling site, and returned to the laboratory without reopening. Trip blanks will be used to assess whether analytical results for PCBs were affected by an exposure to an environmental contaminant between the time the sample containers left the laboratory and the time the containers return to the laboratory.

5.3.1.3 Field Duplicate

A minimum of 1 per 20 field samples that are collected will have field duplicate samples collected concurrently and analyzed. Field duplicates will consist of a sample that is equally distributed between two (2) sample containers (one [1] container is the sample, the other is the duplicate). This results in two (2) equal samples collected from one (1) sampling location. Field duplicates will be used to assess the consistency of sampling and sample homogeneity. They will be handled, preserved, prepared, and analyzed for all appropriate parameters specified for the project concurrently with the actual samples collected for the project.

5.3.1.4 Matrix Spikes and Matrix Spike Duplicates (MS/MSD)

A minimum of 1 per 20 field samples that are collected will have MS/MSD duplicate samples collected concurrently and analyzed. MS/MSD duplicates will consist of a sample that is equally distributed between three (3) sample containers (one [1] container is the sample, one [1] container is the MS sample, and one [1] container is the MSD sample). They will be handled, preserved, prepared, and analyzed for all appropriate parameters specified for the project concurrently with the actual samples collected for the project.

5.3.2 Analytical Quality Control Samples

The analytical methods referenced in the PCBs analysis by Method 8082A QA/QC Requirements address the QC procedures required and the frequency of replicates, matrix spike samples, blanks, calibration standards, internal standards, GC/MS confirmation of volatiles, surrogate spike samples, and laboratory duplicates.

6.0 DATA EVALUATION

This data evaluation portion of the plan presents a description of how the laboratory data will be interpreted and presented in the subsequent Sampling Report of Findings. The report will include an introduction, the sampling methodology, the analytical results and recommendations for a vessel specific remedial work plan.

Data will be presented and interpreted in the Sampling Report of Findings. The Sampling Report of Findings will at the minimum, include the following:

- An introduction;
- The sampling methodology;
- The analytical results; and
- Recommendations for a vessel specific remedial work plan.

It should be noted that the sample ID designations used during sample collection will also be used in the findings of the report as an easy way to identify the sample type, location, and corresponding PCB concentration. In addition, photographs of sample locations and deck drawings with sample locations will be included in the Sampling Report of Findings.

7.0 SITE SPECIFIC HEALTH AND SAFETY PLAN

A site specific Health and Safety Plan (HASP) can be found in **Appendix D**.

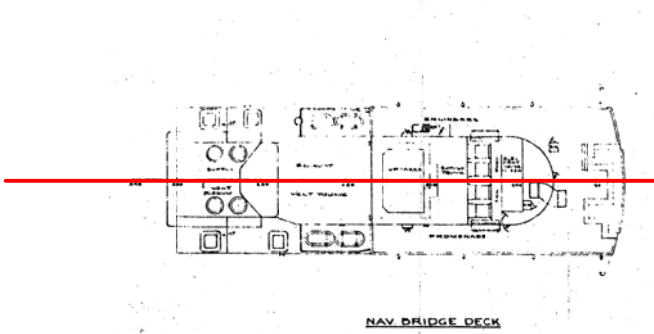
APPENDIX A

DECK DRAWINGS SURVEY RESULTS TABLES & MATERIALS PHOTOGRAPH KEY

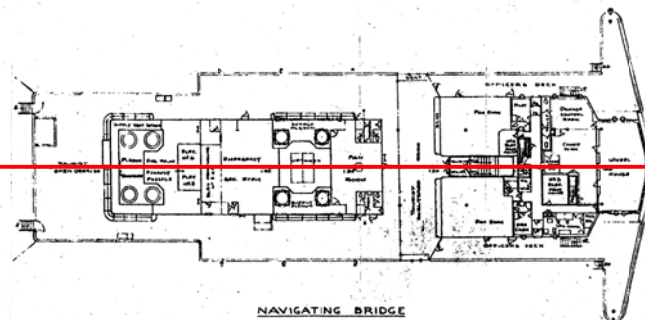
SS United States
Potential PCB Containing Materials Survey
Deck Divisions
June 2011

- Navigation Deck -

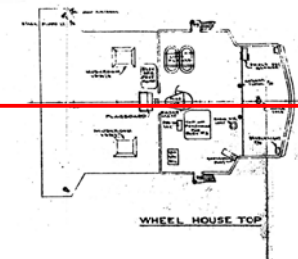
AFT
PORT



AFT
STARBOARD



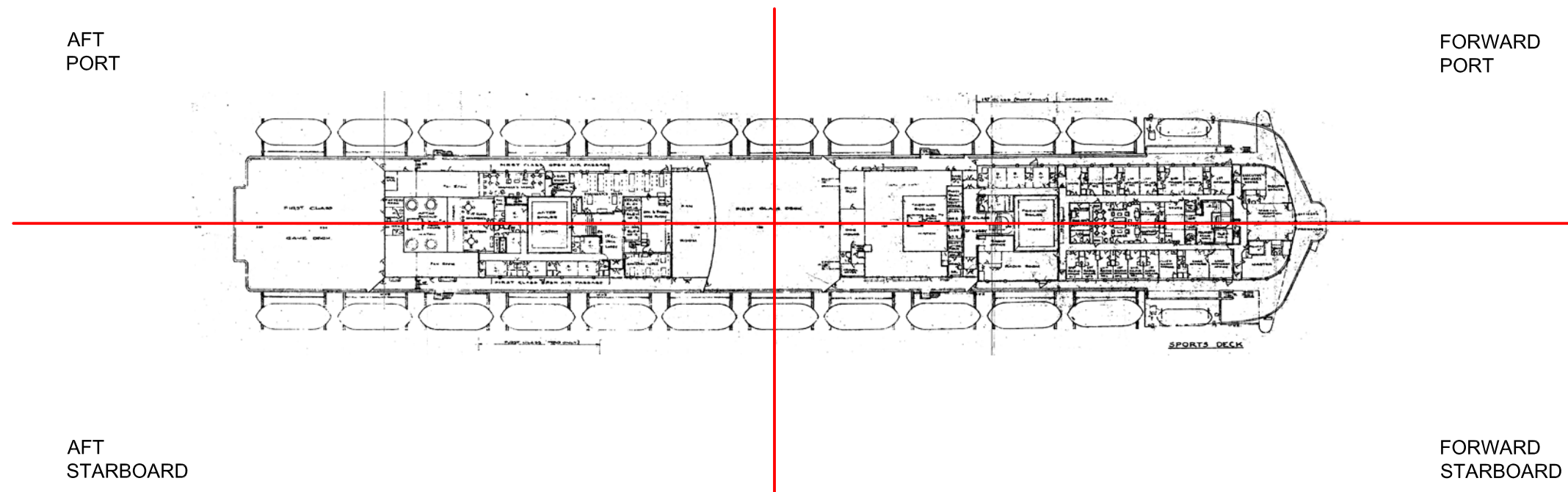
FORWARD
PORT



FORWARD
STARBOARD

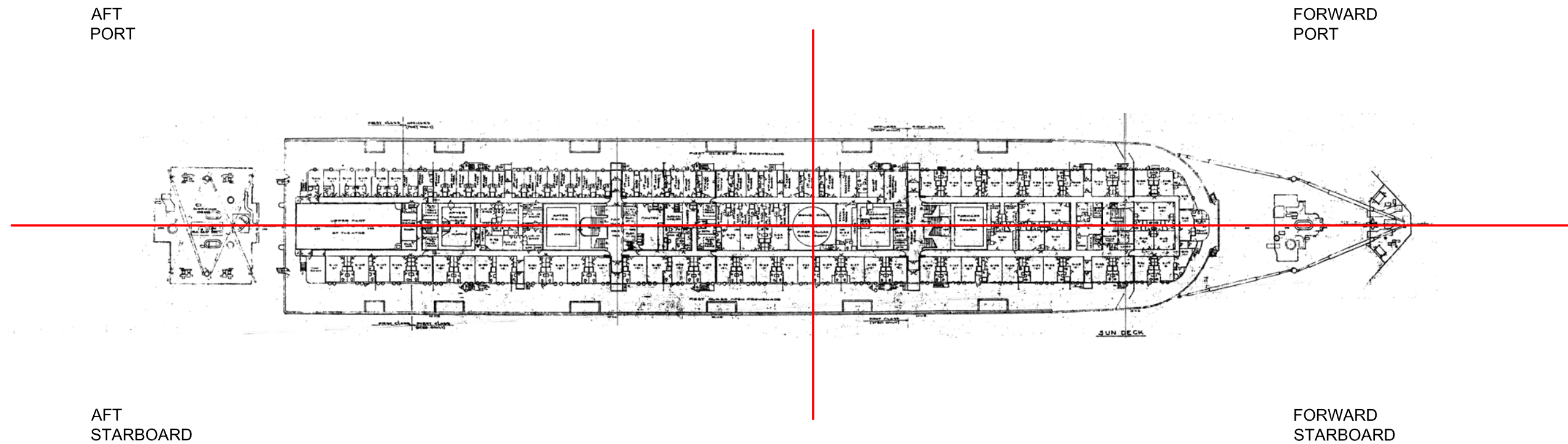
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Potential PCB Containing Materials Survey
Deck Divisions
June 2011

- Sports Deck -



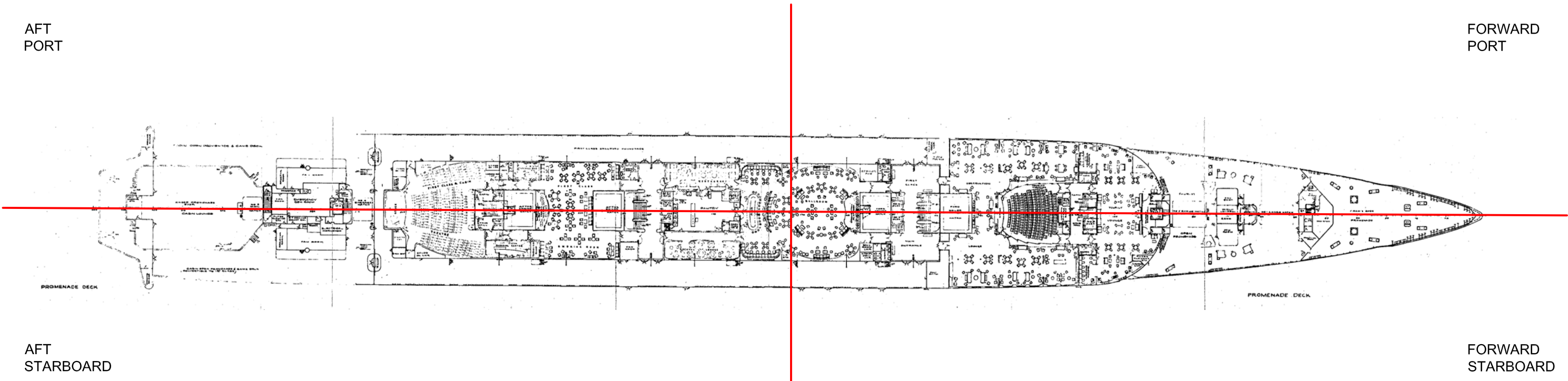
SS United States
Potential PCB Containing Materials Survey
Deck Divisions
June 2011

- Sun Deck -



SS United States
Potential PCB Containing Materials Survey
Deck Division
June 2011

- Promenade Deck -

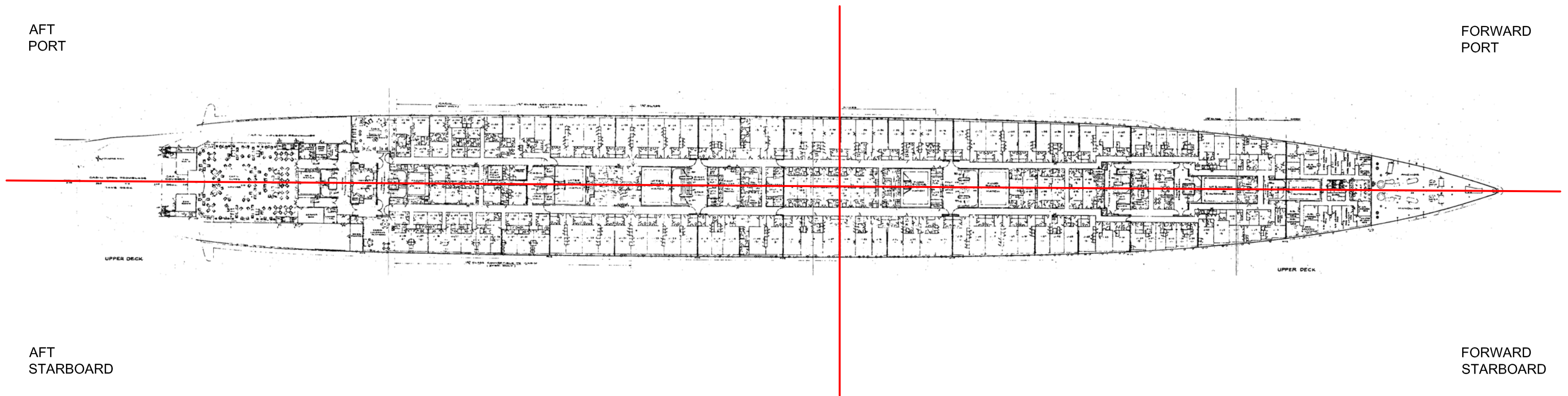


SS United States
Potential PCB Containing Materials Survey
Deck Divisions
June 2011

- Upper Deck -

AFT
PORT

FORWARD
PORT

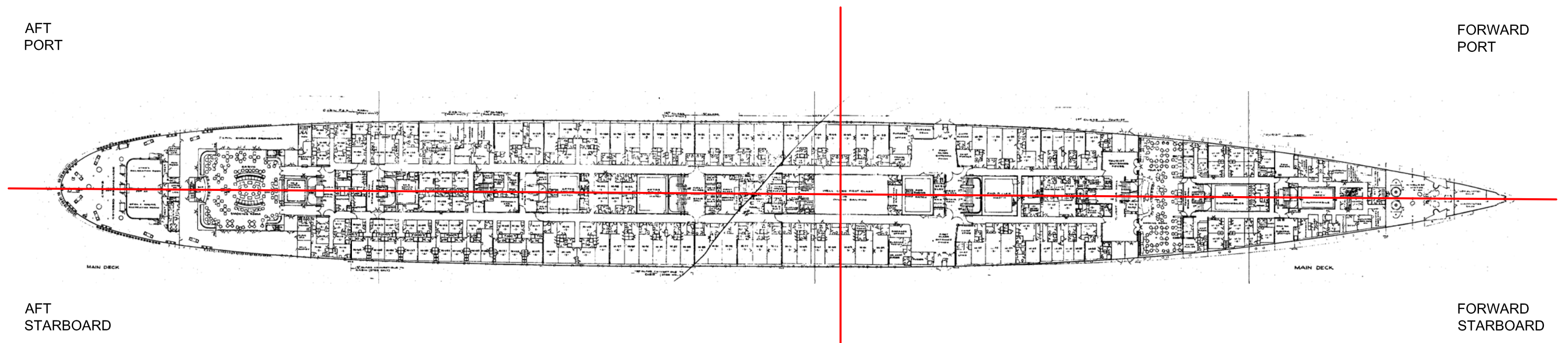


AFT
STARBOARD

FORWARD
STARBOARD

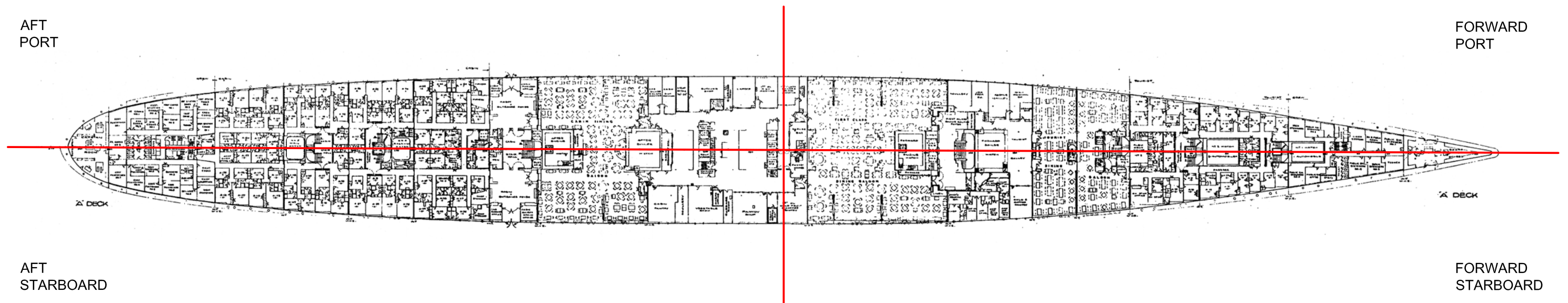
SS United States
Potential PCB Containing Materials Survey
Deck Divisions
June 2011

- Main Deck -



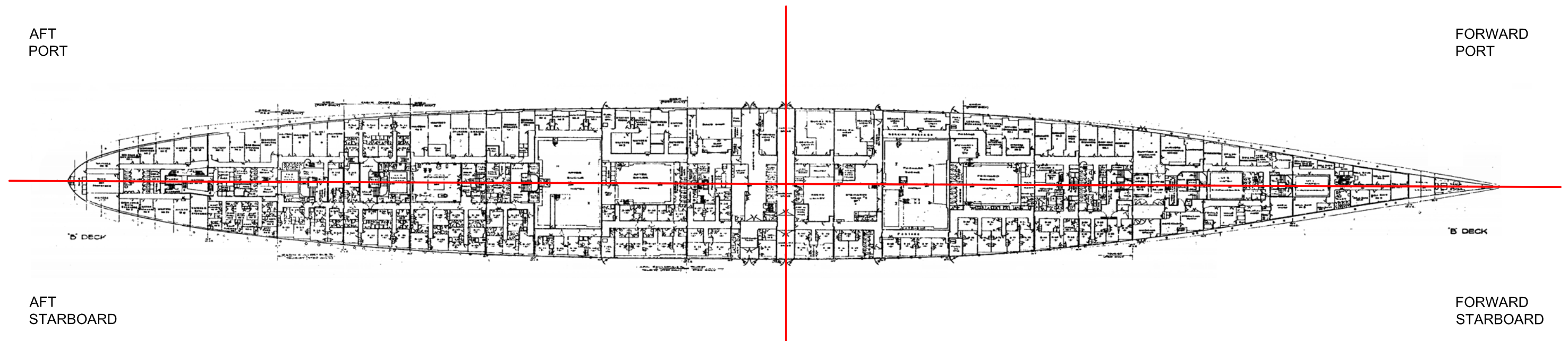
SS United States
Potential PCB Containing Materials Survey
Deck Divisions
June 2011

- A Deck -



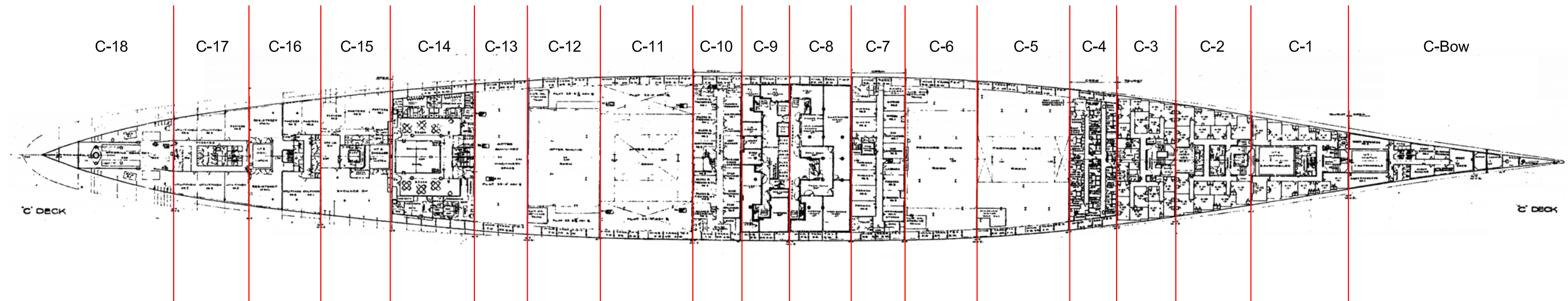
SS United States
Potential PCB Containing Materials Survey
Deck Divisions
June 2011

- B Deck -



SS United States
Potential PCB Containing Materials Survey
Deck Divisions
June 2011

- C Deck -

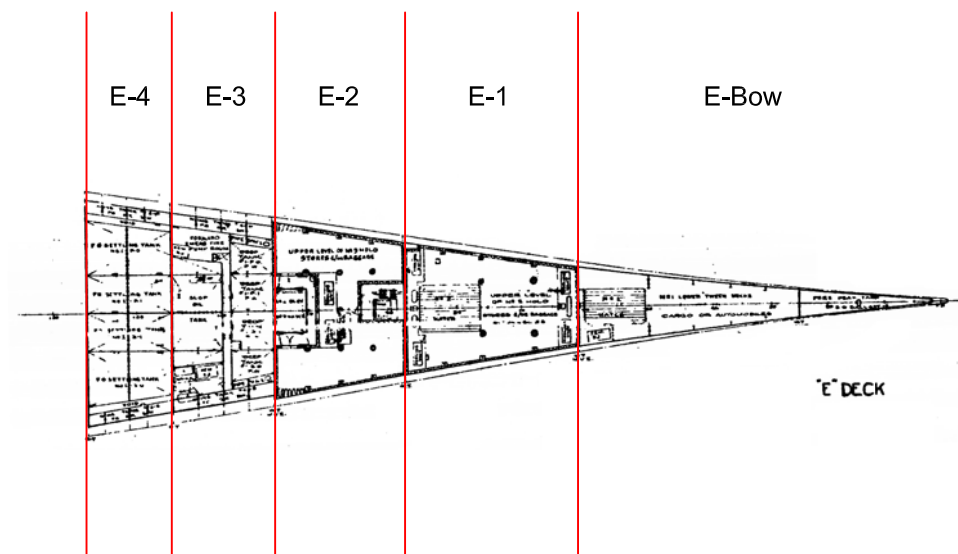


- D Deck -



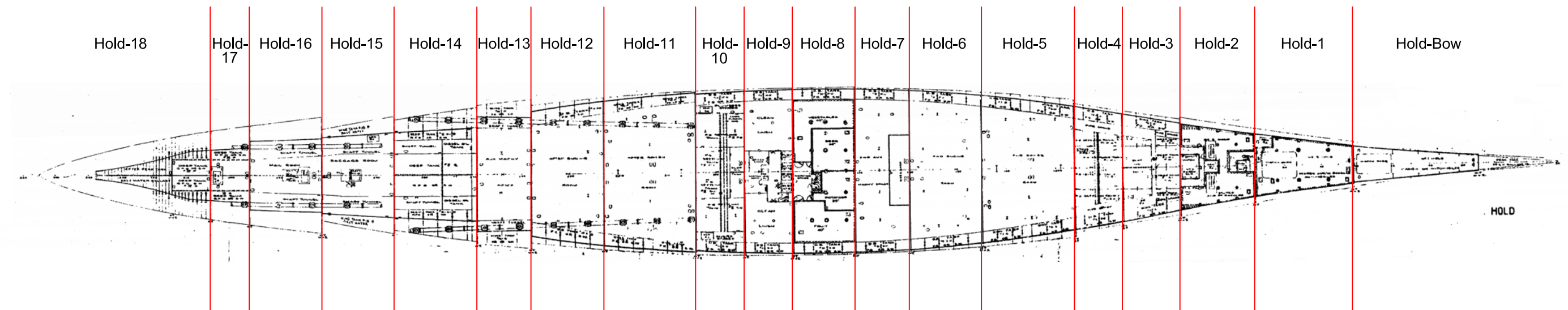
SS United States
Potential PCB Containing Materials Survey
Deck Divisions
June 2011

- E Deck -



SS United States
Potential PCB Containing Materials Survey
Deck Divisions
June 2011

- Hold Deck -



Locations of Materials Observed
Wire

Deck	A	B	C	D	E	F	G	H	I	J	K	L	M	O	P	Q	Elevator Control Panel	Fan Room Control Panel
Navigation Deck																		
Fwd Star	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X
Fwd Port	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X		X
Aft Star	X	X	X									X						X
Aft Port	X	X	X									X						X
Sports Deck																		
Fwd Star	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X		
Fwd Port	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
Aft Star	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			X
Aft Port	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			X
Sun Deck																		
Fwd Star	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	
Fwd Port	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X		
Aft Star	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	
Aft Port	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	
Promenade Deck																		
Fwd Star	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X		X
Fwd Port	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X		X
Aft Star	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X		X
Aft Port	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X		X
Upper Deck																		
Fwd Star	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X		
Fwd Port	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X		
Aft Star	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X		X
Aft Port	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X
Main Deck																		
Fwd Star	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X		X
Fwd Port	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X		X
Aft Star	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	
Aft Port	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X		X
A Deck																		
Fwd Star	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X		
Fwd Port	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	
Aft Star	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X		
Aft Port	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X		
B Deck																		
Fwd Star	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X		X
Fwd Port	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X		X
Aft Star	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X		X
Aft Port	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X

Locations of Materials Observed
Wire

Deck	A	B	C	D	E	F	G	H	I	J	K	L	M	O	P	Q	Elevator Control Panel	Fan Room Control Panel
C Deck																		
C Bow	X	X	X									X						
C-1	X	X	X									X						
C-2	X	X	X									X						
C-3	X	X	X									X						
C-4	X	X	X									X						
C-5 - Fwd Boiler	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			
C-6 - Fwd Engine	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			
C-7	X	X	X									X						
C-8	X	X	X	X		X						X						
C-9	X	X	X									X						
C-10	X	X	X									X						
C-11 - Aft Boiler	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			
C-12 - Aft Engine	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			
C-13 - Aft Aux	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			
C-14	X	X	X									X						
C-15	X	X	X									X						
C-16	X	X	X									X						
C-17	X	X	X									X						
C-18	X	X	X									X						
D Deck																		
D-Bow	X	X	X									X						
D-1	X	X	X									X						
D-2	X	X	X									X						
D-3	X	X	X									X						
D-4	X	X	X									X						
D-5 - Fwd Boiler	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			
D-6 - Fwd Engine	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			
D-7 - Fwd Aux	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			
D-8	X	X	X	X		X						X						
D-9	X	X	X									X						
D-10	X	X	X									X						
D-11 - Aft Boiler	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			
D-12 - Aft Engine	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			
D-13 - Aft Aux	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			
D-14	X	X	X									X						
D-15	X	X	X									X						
D-16	X	X	X									X						
D-17	X	X	X									X						
D-18	X	X	X									X						

Section should not be accessed for sampling due to Health & Safety concerns.

Locations of Materials Observed
Wire

Deck	A	B	C	D	E	F	G	H	I	J	K	L	M	O	P	Q	Elevator Control Panel	Fan Room Control Panel
E Deck																		
E-Bow	X	X	X									X						
E-1	X	X	X									X						
E-2	X	X	X									X						
E-3	X	X	X									X						
E-4	X	X	X									X						
Hold																		
Hold-Bow	X	X	X									X						
Hold-1	X	X	X									X						
Hold-2	X	X	X									X						
Hold-3	X	X	X									X						
Hold-4	X	X	X									X						
Hold-5 - Fwd Boiler	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			
Hold-6 - Fwd Engine	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			
Hold-7 - Fwd Aux	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			
Hold-8	X	X	X	X		X						X						
Hold-9	X	X	X									X						
Hold-10	X	X	X									X						
Hold-11 - Aft Boiler	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			
Hold-12 - Aft Engine	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			
Hold-13 - Aft Aux	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			
Hold-14	X	X	X									X						
Hold-15	X	X	X									X						
Hold-16	X	X	X									X						
Hold-17	X	X	X									X						
Hold-18	X	X	X									X						

Section should not be accessed for sampling due to Health & Safety concerns.

Locations of Materials Observed
Paint

Deck	Exterior Yellow	Exterior White	Exterior Red	Exterior Black	Exterior Silver	Interior Yellow	Interior White	Interior Red	Interior Black	Interior Silver	Interior Pink	Interior Gold	Interior Blue	Interior Green	Interior Tan	Interior Gray	Interior Light Blue	Interior Light Green	Interior Brown
C Deck																			
C Bow			X					X		X									
C-1			X			X			X										
C-2			X			X	X	X	X	X									
C-3			X			X	X		X										
C-4			X			X	X												
C-5 - Fwd Boiler			X				X												
C-6 - Fwd Engine			X																
C-7			X			X	X												
C-8			X				X			X						X	X		
C-9			X				X									X			
C-10			X			X	X												
C-11 - Aft Boiler			X			X	X			X									
C-12 - Aft Engine			X				X												
C-13 - Aft Aux			X																
C-14			X			X	X	X		X			X				X		
C-15			X				X	X		X									
C-16			X			X	X		X										
C-17			X			X	X		X										
C-18			X				X												
D Deck																			
D-Bow			X					X		X									
D-1			X			X			X										
D-2			X			X	X	X	X	X									
D-3			X			X	X												
D-4			X				X												
D-5 - Fwd Boiler			X				X	X											
D-6 - Fwd Engine			X																
D-7 - Fwd Aux			X																
D-8			X			X	X									X			
D-9			X				X									X			
D-10			X				X												
D-11 - Aft Boiler			X			X	X			X			X						
D-12 - Aft Engine			X				X	X		X									
D-13 - Aft Aux			X				X	X											
D-14			X			X													
D-15			X			X													
D-16			X				X												
D-17			X																
D-18																			

Section should not be accessed for sampling due to Health & Safety concerns.

Locations of Materials Observed
Paint

Deck	Exterior Yellow	Exterior White	Exterior Red	Exterior Black	Exterior Silver	Interior Yellow	Interior White	Interior Red	Interior Black	Interior Silver	Interior Pink	Interior Gold	Interior Blue	Interior Green	Interior Tan	Interior Gray	Interior Light Blue	Interior Light Green	Interior Brown
E Deck																			
E-Bow			X					X		X									
E-1			X							X									
E-2			X				X			X									
E-3			X			X	X												
E-4			X																
Hold																			
Hold-Bow			X																
Hold-1			X				X			X									
Hold-2			X				X			X									
Hold-3			X				X												
Hold-4			X																
Hold-5 - Fwd Boiler			X																
Hold-6 - Fwd Engine			X																
Hold-7 - Fwd Aux			X																
Hold-8			X				X									X			
Hold-9			X				X									X			
Hold-10			X																
Hold-11 - Aft Boiler			X																
Hold-12 - Aft Engine			X																
Hold-13 - Aft Aux			X																
Hold-14			X				X												
Hold-15			X				X												
Hold-16			X				X												
Hold-17			X				X												
Hold-18																			

Section should not be accessed for sampling due to Health & Safety concerns.

Locations of Materials Observed
Miscellaneous Materials

Deck	WTD Door Gaskets	Porthole Gaskets	WTD Hatch Gasket	Window Gasket	WT Light Gasket	Electric Box Gaskets	Elevator Door Gasket	Refrigerator Door Gasket	Dust Filter Rubber Gaskets	Vent Gasket Fabric	Black Sealant	White Caulk	Port Hole Caulk	Window Caulk	Noise Bushing	Life Boat Rubber Mount	Rubber stops	Rubber Push Buttons	4x4 Floor Tile
Navigation Deck																			
Fwd Star	X	X	X	X		X			X	X	X	X	X	X	X		X		
Fwd Port	X	X	X	X		X			X	X	X		X	X	X		X		
Aft Star		X	X						X	X			X		X				
Aft Port		X	X						X	X			X		X				
Sports Deck																			
Fwd Star	X	X					X				X		X			X	X		
Fwd Port	X	X					X		X	X	X		X		X				
Aft Star	X	X					X		X	X	X		X		X				X
Aft Port	X	X					X		X	X	X		X		X				
Sun Deck																			
Fwd Star	X	X	X				X						X					X	
Fwd Port	X	X	X				X						X					X	
Aft Star	X	X	X				X		X	X	X		X		X			X	X
Aft Port	X	X	X				X		X	X	X		X		X			X	X
Promenade Deck																			
Fwd Star	X	X	X	X	X		X		X	X	X		X		X			X	X
Fwd Port	X	X	X	X	X		X		X	X	X		X		X			X	X
Aft Star	X	X	X	X	X		X		X	X	X		X	X	X				X
Aft Port	X	X	X	X	X		X				X		X	X					X
Upper Deck																			
Fwd Star	X	X	X				X				X		X	X					
Fwd Port	X	X	X				X				X		X	X					
Aft Star	X	X		X			X		X	X			X		X				X
Aft Port	X	X		X			X		X	X			X		X				X
Main Deck																			
Fwd Star	X	X			X		X						X					X	X
Fwd Port	X	X			X		X						X					X	X
Aft Star	X	X		X	X		X		X	X	X		X		X				X
Aft Port	X	X		X	X		X		X	X	X		X		X				X
A Deck																			
Fwd Star		X			X		X						X						X
Fwd Port		X			X		X						X						X
Aft Star	X	X			X		X						X						X
Aft Port	X	X			X		X						X						X
B Deck																			
Fwd Star		X			X		X						X				X		X
Fwd Port		X			X		X						X				X		X
Aft Star	X	X					X		X	X			X		X			X	
Aft Port	X	X					X		X	X			X		X			X	

Locations of Materials Observed
Miscellaneous Materials

Deck	WTD Door Gaskets	Porthole Gaskets	WTD Hatch Gasket	Window Gasket	WT Light Gasket	Electric Box Gaskets	Elevator Door Gasket	Refrigerator Door Gasket	Dust Filter Rubber Gaskets	Vent Gasket Fabric	Black Sealant	White Caulk	Port Hole Caulk	Window Caulk	Noise Bushing	Life Boat Rubber Mount	Rubber stops	Rubber Push Buttons	4x4 Floor Tile
C Deck																			
C Bow																		X	
C-1					X														
C-2					X														
C-3							X												
C-4																			
C-5 - Fwd Boiler																			
C-6 - Fwd Engine																			
C-7					X														X
C-8								X											
C-9							X	X											
C-10					X														
C-11 - Aft Boiler																		X	
C-12 - Aft Engine																		X	
C-13 - Aft Aux																		X	
C-14							X												
C-15					X													X	
C-16																		X	
C-17					X														
C-18																		X	
D Deck																			
D-Bow																		X	
D-1					X														
D-2					X														
D-3							X												
D-4																		X	
D-5 - Fwd Boiler																		X	
D-6 - Fwd Engine																		X	
D-7 - Fwd Aux																			
D-8								X										X	
D-9							X												X
D-10																			
D-11 - Aft Boiler																		X	
D-12 - Aft Engine	X																		
D-13 - Aft Aux	X																	X	
D-14																			
D-15					X														
D-16																			
D-17																			
D-18																			

Section should not be accessed for sampling due to Health & Safety concerns.

Locations of Materials Observed
Miscellaneous Materials

Deck	WTD Door Gaskets	Porthole Gaskets	WTD Hatch Gasket	Window Gasket	WT Light Gasket	Electric Box Gaskets	Elevator Door Gasket	Refrigerator Door Gasket	Dust Filter Rubber Gaskets	Vent Gasket Fabric	Black Sealant	White Caulk	Port Hole Caulk	Window Caulk	Noise Bushing	Life Boat Rubber Mount	Rubber stops	Rubber Push Buttons	4x4 Floor Tile
E Deck																			
E-Bow					X														
E-1					X														
E-2					X			X										X	
E-3	X																	X	
E-4																			
Hold																			
Hold-Bow																			
Hold-1					X			X										X	
Hold-2					X			X									X	X	
Hold-3																			
Hold-4																			
Hold-5 - Fwd Boiler																			
Hold-6 - Fwd Engine																			
Hold-7 - Fwd Aux																		X	
Hold-8								X										X	
Hold-9							X												
Hold-10																		X	
Hold-11 - Aft Boiler																			
Hold-12 - Aft Engine																			
Hold-13 - Aft Aux																			
Hold-14																			
Hold-15					X														
Hold-16																			
Hold-17																			
Hold-18																			

Section should not be accessed for sampling due to Health & Safety concerns.

Locations of Materials Observed
Miscellaneous Materials

Deck	9x9 Floor Tile	12x6 Floor Tile	12x12 Floor Tile	15x15 Floor Tile	15x15 w/ Small Center Circle Floor Tile	15x15 Black Tile w/ Open White Squares at Corners	Blue w/ Big White Circle Flooring	Red w/ Tan Stripe Flooring	Black w/ 2 Thin White Stripes Flooring	Sheet Floor Covering	Green Deck Coat	Oil Stain (Wipe)	Liquid Oil	Elevator Machine Oil (Wipe)	Grease	WTD Gear Covers	Insulation	Cork Insulation	Pipe Wrap / Insulation	Fluoresc. Lights
Navigation Deck																				
Fwd Star	X										X	X	X	X	X		X	X		
Fwd Port	X										X	X	X	X	X		X	X		
Aft Star											X						X			
Aft Port											X						X			
Sports Deck																				
Fwd Star	X									X	X	X								
Fwd Port	X			X						X	X						X	X		
Aft Star			X	X													X	X		
Aft Port			X														X			
Sun Deck																				
Fwd Star	X			X			X				X			X	X			X		
Fwd Port	X			X							X							X		
Aft Star	X		X								X			X	X			X		X
Aft Port	X										X			X	X			X		X
Promenade Deck																				
Fwd Star	X		X	X						X		X					X			
Fwd Port	X		X	X						X		X					X			
Aft Star	X	X	X								X	X		X	X		X	X		X
Aft Port	X	X	X	X							X	X	X				X			
Upper Deck																				
Fwd Star	X		X	X			X	X				X						X		X
Fwd Port	X		X	X			X	X				X						X		X
Aft Star	X			X	X		X				X						X	X		X
Aft Port	X			X	X		X				X			X	X		X	X		X
Main Deck																				
Fwd Star					X			X	X			X	X			X	X	X		X
Fwd Port					X			X	X			X	X			X	X	X		X
Aft Star	X		X	X			X							X	X	X		X		X
Aft Port	X		X	X			X									X	X	X		X
A Deck																				
Fwd Star								X	X	X			X	X	X					
Fwd Port								X	X	X			X	X	X					
Aft Star	X		X	X		X						X				X	X	X		X
Aft Port	X		X	X		X						X				X		X		X
B Deck																				
Fwd Star	X							X				X				X	X	X		X
Fwd Port	X							X				X				X	X	X		X
Aft Star																	X	X		
Aft Port														X	X		X	X		

Locations of Materials Observed
Miscellaneous Materials

Deck	9x9 Floor Tile	12x6 Floor Tile	12x12 Floor Tile	15x15 Floor Tile	15x15 w/ Small Center Circle Floor Tile	15x15 Black Tile w/ Open White Squares at Corners	Blue w/ Big White Circle Flooring	Red w/ Tan Stripe Flooring	Black w/ 2 Thin White Stripes Flooring	Sheet Floor Covering	Green Deck Coat	Oil Stain (Wipe)	Liquid Oil	Elevator Machine Oil (Wipe)	Grease	WTD Gear Covers	Insulation	Cork Insulation	Pipe Wrap / Insulation	Fluoresc. Lights
C Deck																				
C Bow												X								
C-1	X							X		X								X		
C-2	X		X					X				X						X		
C-3			X					X										X		
C-4								X										X		
C-5 - Fwd Boiler												X	X		X					
C-6 - Fwd Engine													X		X			X		
C-7	X																X	X		
C-8																		X		
C-9																	X	X	X	
C-10												X						X		
C-11 - Aft Boiler												X			X					X
C-12 - Aft Engine													X	X	X			X		
C-13 - Aft Aux												X	X	X	X	X		X	X	
C-14																		X		
C-15												X						X		
C-16	X											X								
C-17	X																			
C-18												X	X							
D Deck																				
D-Bow												X								
D-1	X							X										X		
D-2	X		X					X				X						X		
D-3			X					X										X		
D-4																		X		
D-5 - Fwd Boiler													X		X			X		
D-6 - Fwd Engine													X		X					
D-7 - Fwd Aux													X		X				X	
D-8																		X	X	
D-9																				
D-10												X								
D-11 - Aft Boiler													X		X					
D-12 - Aft Engine													X		X					
D-13 - Aft Aux														X	X			X	X	
D-14																				
D-15																				
D-16																				
D-17																				
D-18																				

Section should not be accessed for sampling due to Health & Safety concerns.

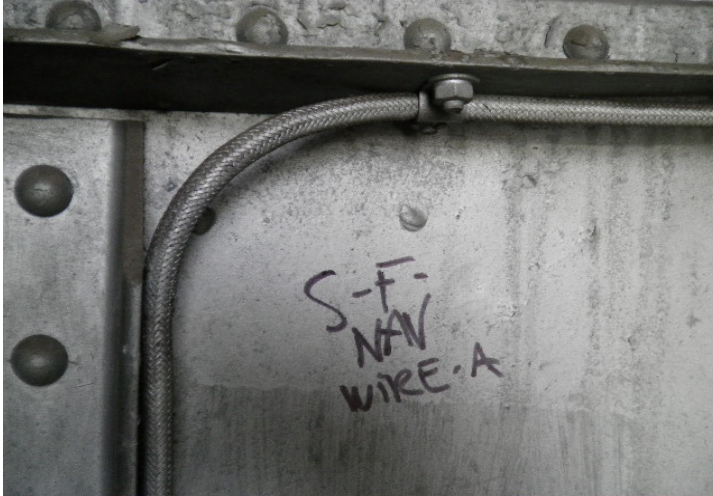
Locations of Materials Observed
Miscellaneous Materials

Deck	9x9 Floor Tile	12x6 Floor Tile	12x12 Floor Tile	15x15 Floor Tile	15x15 w/ Small Center Circle Floor Tile	15x15 Black Tile w/ Open White Squares at Corners	Blue w/ Big White Circle Flooring	Red w/ Tan Stripe Flooring	Black w/ 2 Thin White Stripes Flooring	Sheet Floor Covering	Green Deck Coat	Oil Stain (Wipe)	Liquid Oil	Elevator Machine Oil (Wipe)	Grease	WTD Gear Covers	Insulation	Cork Insulation	Pipe Wrap / Insulation	Fluoresc. Lights
E Deck																				
E-Bow																				
E-1																		X		
E-2																		X		
E-3												X						X		
E-4												X								
Hold																				
Hold-Bow																				
Hold-1																		X		
Hold-2													X		X			X		
Hold-3												X								
Hold-4													X							
Hold-5 - Fwd Boiler													X		X					
Hold-6 - Fwd Engine												X	X		X					
Hold-7 - Fwd Aux																		X		
Hold-8													X							
Hold-9												X	X	X						
Hold-10													X							
Hold-11 - Aft Boiler													X		X					
Hold-12 - Aft Engine													X		X					
Hold-13 - Aft Aux																				
Hold-14													X							
Hold-15												X								
Hold-16													X							
Hold-17													X							
Hold-18																				

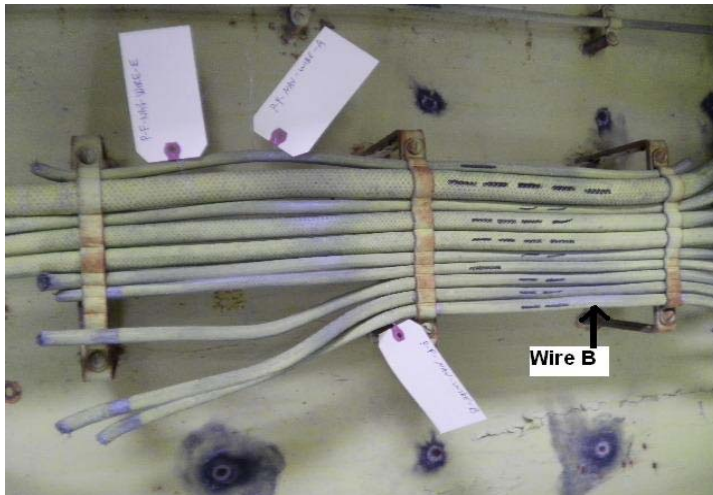
Section should not be accessed for sampling due to Health & Safety concerns.

SSUS
MATERIALS SURVEY
WIRE INVENTORY PHOTO KEY

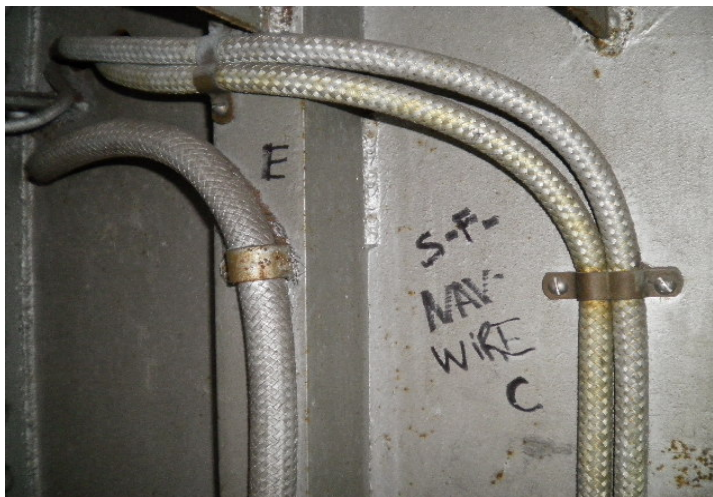
A:
11 mm (unpainted)
12-13 mm (painted)



B:
14-15 mm (painted)

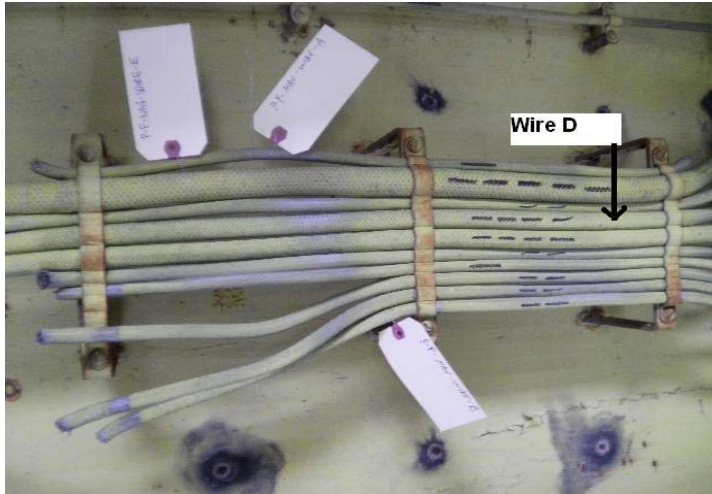


C:
17-18 mm (painted)

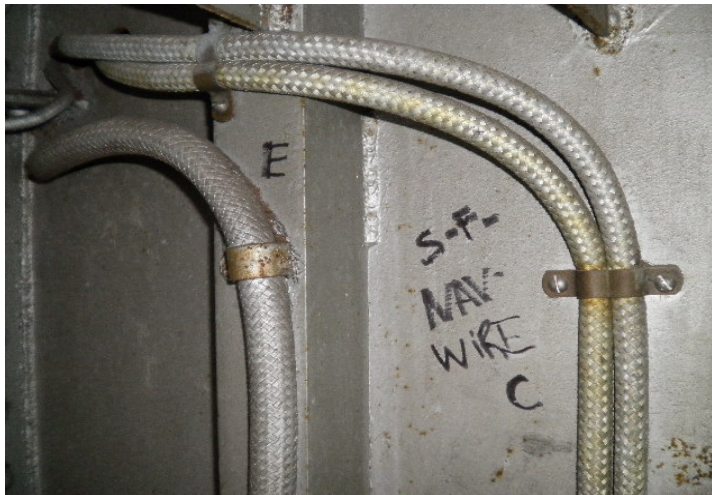


SSUS
MATERIALS SURVEY
WIRE INVENTORY PHOTO KEY

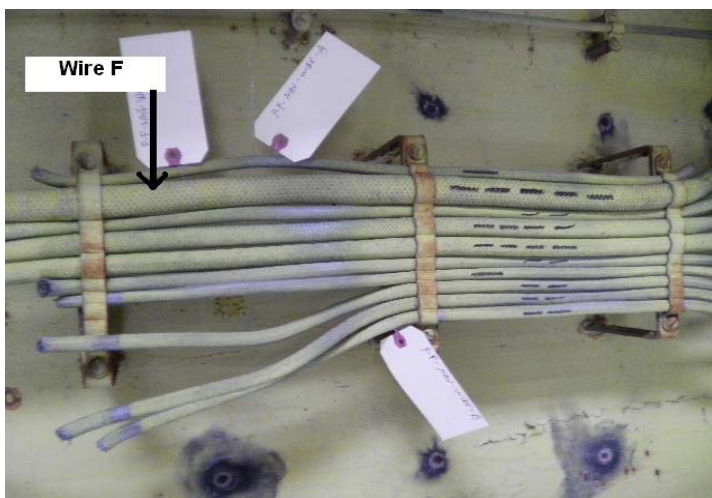
D:
20 mm (painted)



E:
23-24 mm (painted)



F:
28-29 mm (painted)



SSUS
MATERIALS SURVEY
WIRE INVENTORY PHOTO KEY

G:
30 mm (painted)



H:
40 mm (unpainted)

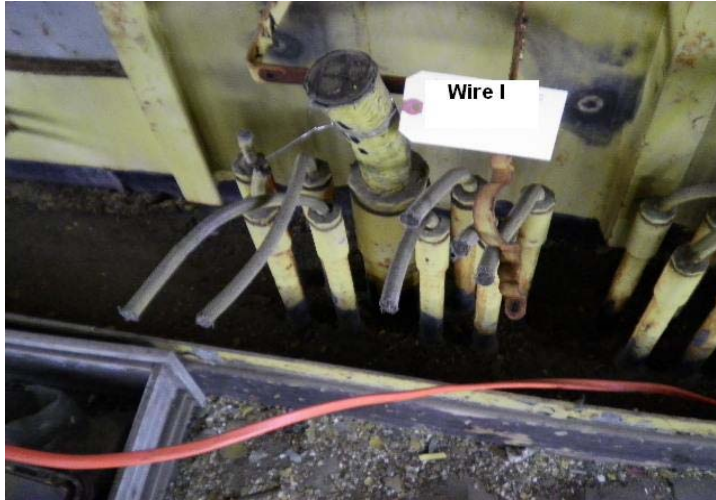


H:
42 mm (painted)



SSUS
MATERIALS SURVEY
WIRE INVENTORY PHOTO KEY

I:
48 mm (painted)



J:
53 mm (painted)



K:
66 mm (painted)



SSUS
MATERIALS SURVEY
WIRE INVENTORY PHOTO KEY

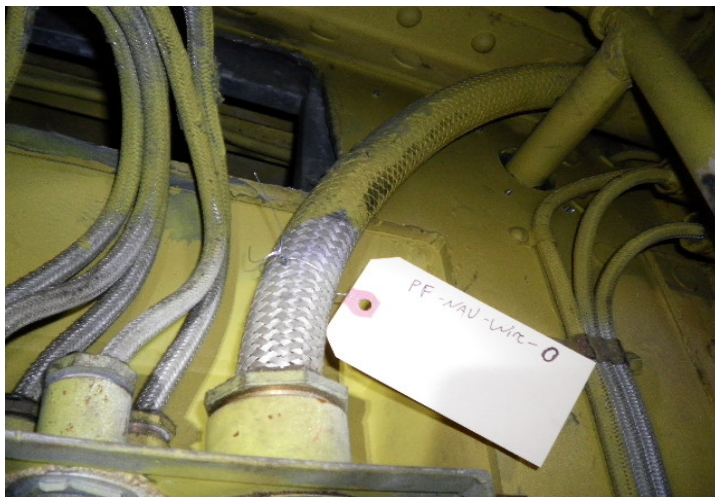
L:
9 mm (painted)



M:
35 mm (painted)

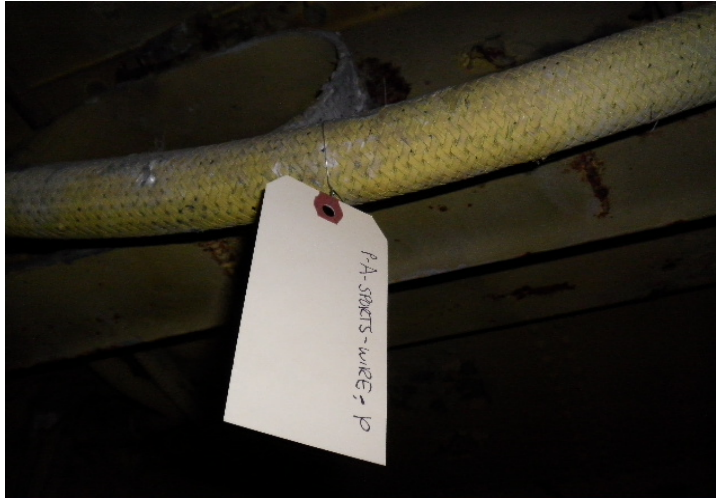


O:
37 mm (painted)



SSUS
MATERIALS SURVEY
WIRE INVENTORY PHOTO KEY

P:
45 mm (painted)



Q:
6 mm (painted)



Elevator Control
Panel:



SSUS
MATERIALS SURVEY
WIRE INVENTORY PHOTO KEY

Fan Room Control
Panel:

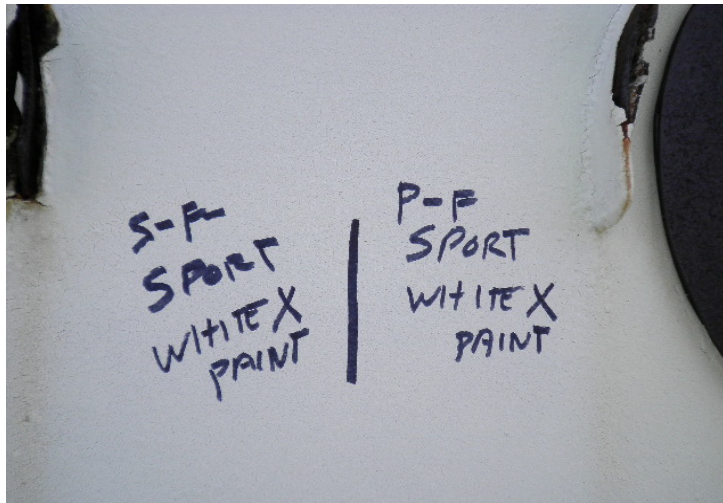


SSUS
MATERIALS SURVEY
PAINT INVENTORY PHOTO KEY

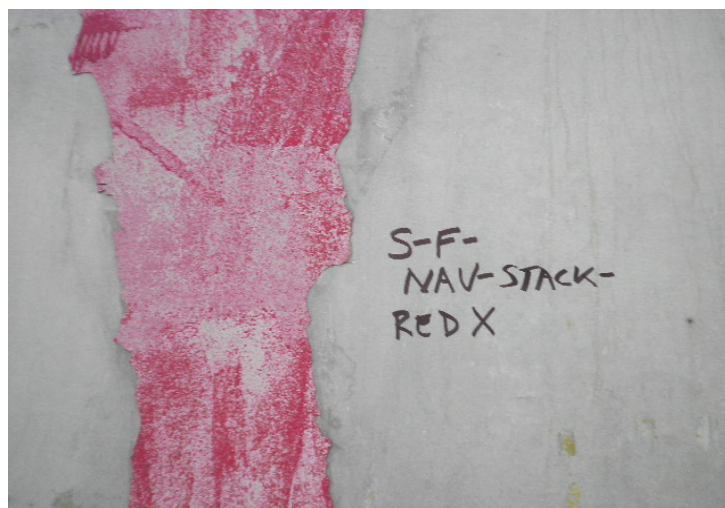
Exterior Yellow:



Exterior White:



Exterior Red:



SSUS
MATERIALS SURVEY
PAINT INVENTORY PHOTO KEY

Exterior Black:



Exterior Silver:



Interior Yellow:



SSUS
MATERIALS SURVEY
PAINT INVENTORY PHOTO KEY

Interior White:



Interior Red:

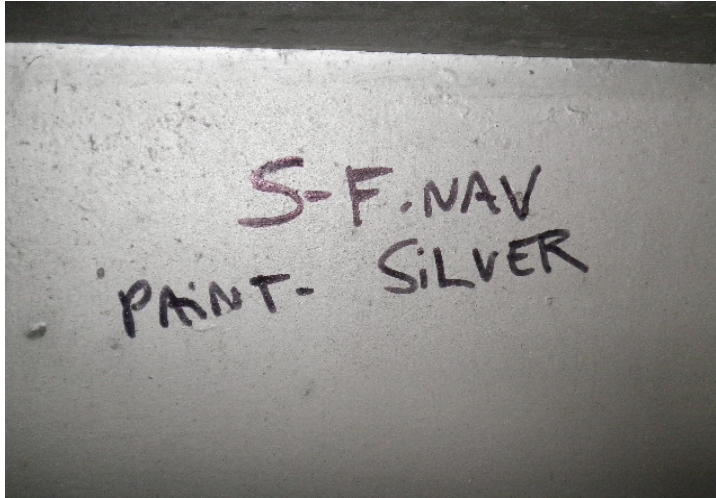


Interior Black:



SSUS
MATERIALS SURVEY
PAINT INVENTORY PHOTO KEY

Interior Silver:



Interior Pink:



Interior Gold:



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MATERIALS SURVEY
PAINT INVENTORY PHOTO KEY

Interior Blue:



Interior Green:



Interior Tan:



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MATERIALS SURVEY
PAINT INVENTORY PHOTO KEY

Interior Gray:



Interior Light Blue:



Interior Light Green:



SSUS
MATERIALS SURVEY
PAINT INVENTORY PHOTO KEY

Interior Brown:

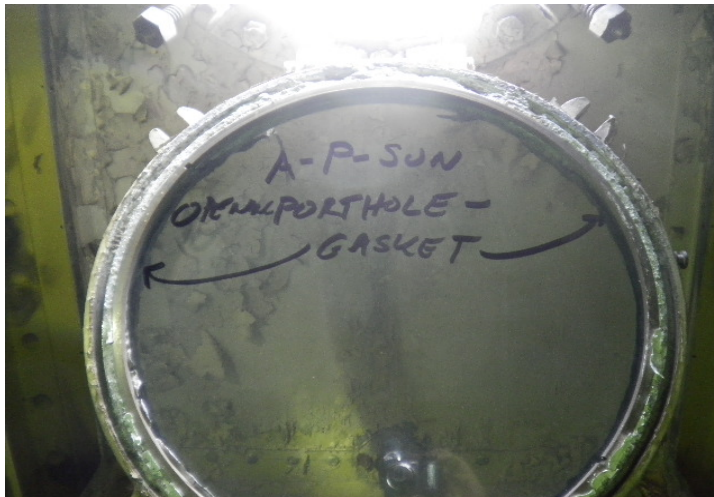


SSUS
MATERIALS SURVEY
OTHER MATERIALS INVENTORY PHOTO KEY

Water Tight Door
(WTD) Door Gasket:



Porthole Gasket:

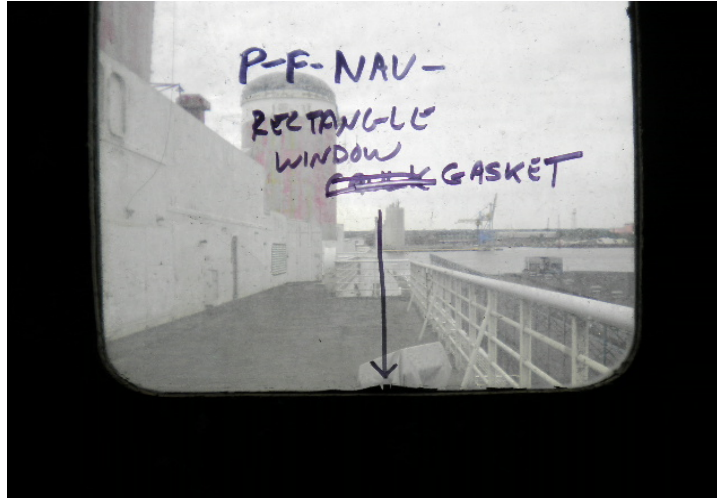


WTD Hatch Gasket:



SSUS
MATERIALS SURVEY
OTHER MATERIALS INVENTORY PHOTO KEY

Window Gasket:



WT Light Gasket:



Electric Box Gasket:



SSUS
MATERIALS SURVEY
OTHER MATERIALS INVENTORY PHOTO KEY

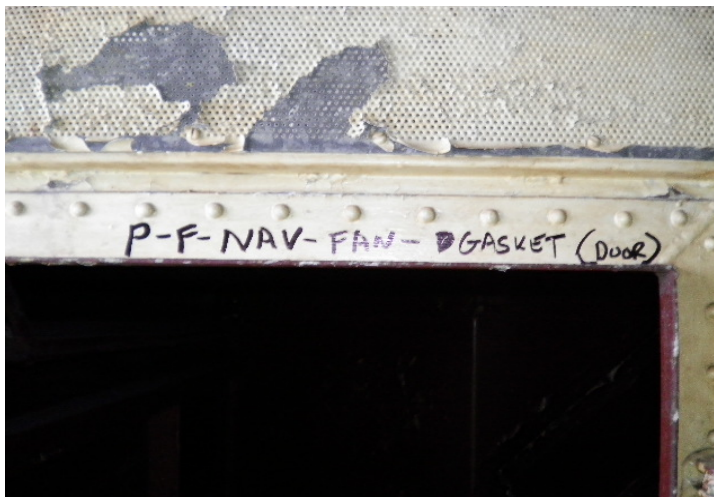
Elevator Door Gasket:



Refrigerator Door
Gasket:



Dust Filter Rubber
Gasket:



SSUS
MATERIALS SURVEY
OTHER MATERIALS INVENTORY PHOTO KEY

Vent Gasket Fabric:



Black Sealant:



White Caulk:



SSUS
MATERIALS SURVEY
OTHER MATERIALS INVENTORY PHOTO KEY

Port Hole Caulk:



Window Caulk:



Noise Bushing:



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MATERIALS SURVEY
OTHER MATERIALS INVENTORY PHOTO KEY

Life Boat Rubber
Mount:



Rubber Stops:



Rubber Push
Buttons:



SSUS
MATERIALS SURVEY
OTHER MATERIALS INVENTORY PHOTO KEY

4x4 Floor Tile:



9x9 Floor Tile:



12x6 Floor Tile:

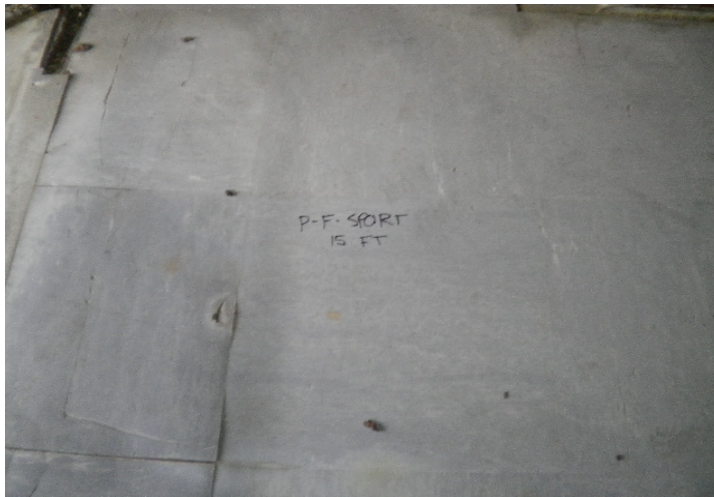


SSUS
MATERIALS SURVEY
OTHER MATERIALS INVENTORY PHOTO KEY

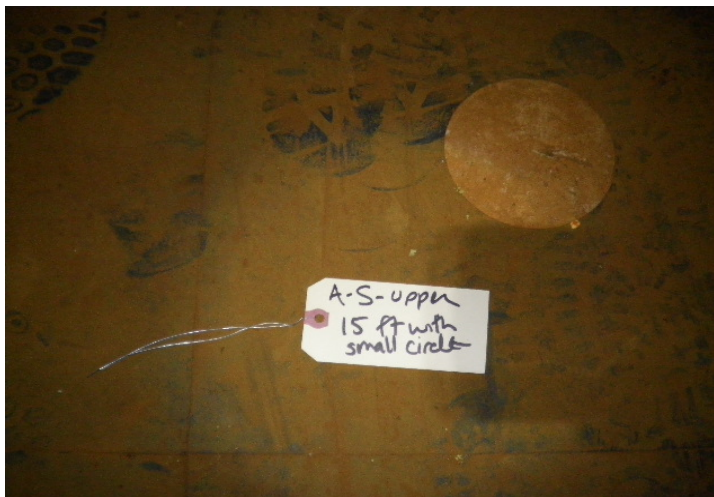
12x12 Floor Tile:



15x15 Floor Tile:



15x15 w/ Small
Center Circle Floor
Tile:

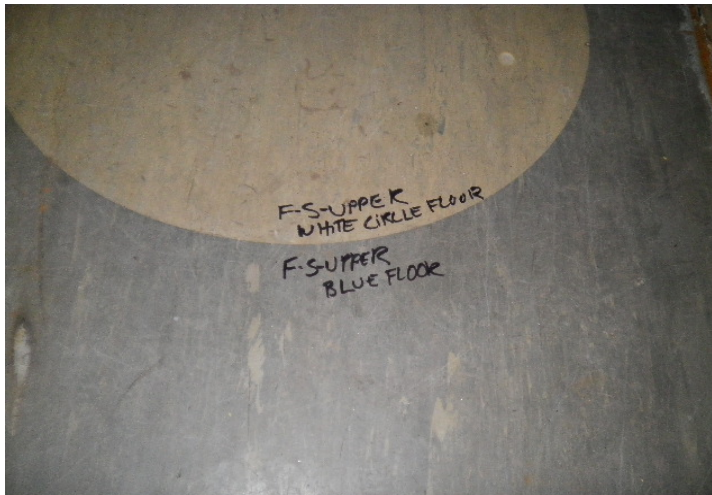


SSUS
MATERIALS SURVEY
OTHER MATERIALS INVENTORY PHOTO KEY

15x15 Black w/ Open
White Squares at
Corners Floor Tile:



Blue w/ Big White
Circle Flooring:



Red w/ Tan Stripes
Flooring:



SSUS
MATERIALS SURVEY
OTHER MATERIALS INVENTORY PHOTO KEY

Black w/ 2 Thin
White Stripes
Flooring:



Sheet Floor Covering:



Green Deck Coat:



SSUS
MATERIALS SURVEY
OTHER MATERIALS INVENTORY PHOTO KEY

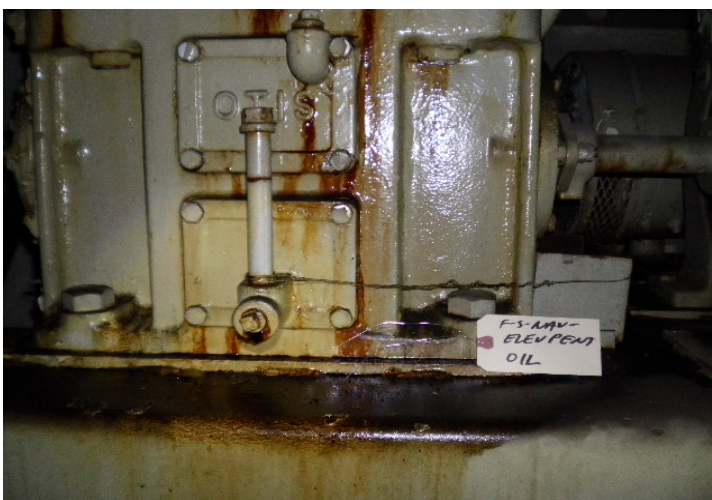
Oil Stain (Wipe):



Liquid Oil:



Elevator Machine
Oil (Wipe):



SSUS
MATERIALS SURVEY
OTHER MATERIALS INVENTORY PHOTO KEY

Grease:



WTD Gear Covers:



Insulation:



SSUS
MATERIALS SURVEY
OTHER MATERIALS INVENTORY PHOTO KEY

Cork Insulation:



Pipe Wrap /
Insulation:



Fluorescent Lights:



APPENDIX B

ATC SAMPLE COLLECTION SOPs

Standard Operating Procedure

PCB Solids Sampling

SS United States

Equipment:

- Kevlar gloves
- Nitrile gloves
- Laboratory supplied sample jar
- Cutting Instrument (knife, razor, battery operated saw)
- Blades for cutting instruments
- Indelible marker or equivalent
- Camera

Sampling:

1. Don Kevlar gloves.
2. Don Nitrile gloves over Kevlar gloves
3. Carefully cut a small piece (i.e. one square inch or about 30 grams) of the material to be sampled using a decontaminated or dedicated cutting instrument.
4. Place the collected sample into a laboratory supplied sample jar.
5. Place the lid on the jar and secure tightly.
6. Note the sample code, date, time and analyses on the sample jar label.
7. Process the sample for shipping per the procedure as described in the sampling plan.
8. Mark the sample location using the sample code with an indelible marker (or equivalent).
9. Photo document the sample location.
10. Enter sample code, date, time analyses and photo number in field notebook.

Standard Operating Procedure

PCB Wipe Sampling

SS United States

Equipment:

- Nitrile gloves
- Dedicated 100 square centimeter (cm²) square template
- Laboratory supplied filter paper (pre-wetted with laboratory grade hexane) and sample jar
- Indelible marker or equivalent
- Camera

Sampling:

1. Don Nitrile gloves.
2. Place a dedicated 100 cm² square template over the surface to be sampled.
3. With a gloved hand, remove the laboratory supplied filter paper (pre-wetted with laboratory grade hexane) from the sample jar and thoroughly wipe the 100 cm² area as measured by the template.
4. Place the filter paper back into the sample jar.
5. Place the lid on the jar and secure tightly.
6. Note the sample code, date, time and analyses on the sample jar label.
7. Process the sample for shipping per the procedure as described in the sampling plan.
8. Mark the sample location using the sample code with an indelible marker (or equivalent).
9. Photo document the sample location.
10. Enter sample code, date, time analyses and photo number in field notebook.

Standard Operating Procedure

PCB Liquids Sampling

SS United States

Equipment:

- Nitrile gloves
- Wrench
- Pliers
- Screw Driver
- Laboratory supplied sample bottle
- Indelible marker or equivalent
- Camera

Sampling:

1. Don Nitrile gloves.
2. Located drain plug, valve or lid that can be opened.
3. Carefully open the drain plug, valve or lid using the appropriate tool.
4. If the liquid can be poured from the equipment, transfer it directly into the laboratory supplied sample bottle. Otherwise use a dedicated colowassa tube or pipette to draw a sample of the liquid and transfer it directly into the laboratory supplied sample bottle.
5. Place the lid on the bottle and secure tightly.
6. Note the sample code, date, time and analyses on the sample jar label.
7. Process the sample for shipping per the procedure as described in the sampling plan.
8. Mark the sample location using the sample code with an indelible marker (or equivalent).
9. Photo document the sample location.
10. Enter sample code, date, time analyses and photo number in field notebook.

Standard Operating Procedure

PCB Paint Sampling

SS United States

Equipment:

- Kevlar gloves
- Nitrile gloves
- Laboratory supplied sample jar
- Scraping Instrument (paint scraper or razor)
- Blades for scraping instruments
- Indelible marker or equivalent
- Camera

Sampling:

1. Don Kevlar gloves.
2. Don Nitrile gloves.
3. Using a decontaminated or dedicated scraping instrument, carefully scrape or cut out a small 2 inch by 2 inch square inch of paint. Be careful not to disturb adjacent materials.
4. Place the collected sample into a laboratory supplied sample jar.
5. Place the lid on the jar and secure tightly.
6. Note the sample code, date, time and analyses on the sample jar label.
7. Process the sample for shipping per the procedure as described in the sampling plan.
8. Mark the sample location using the sample code with an indelible marker (or equivalent).
9. Photo document the sample location.
10. Enter sample code, date, time analyses and photo number in field notebook.

Standard Operating Procedure

Decon

SS United States

Equipment:

- Nitrile gloves
- Non-Phosphate Detergent
- Potable Water
- Type II Water
- Laboratory Grade Hexane
- Brushes
- Tubs
- Waste collection container
- Aluminum foil

Procedure:

1. Don Nitrile gloves.
2. Wipe equipment with a disposable towel soaked with hexane.
3. Wash and scrub equipment with non-phosphate detergent.
4. Rinse equipment with potable water.
5. Rinse equipment with Type II water.
6. Allow equipment to air dry.
7. Wrap equipment in aluminum foil if not being used immediately.

APPENDIX C

LABORATORY SOPs

ACCUTEST ENVIRONMENTAL LABORATORIES

STANDARD OPERATING PROCEDURE

TOP019-01
Pub. Date: 6/2011
Rev. Date: 06/17/11
Page 1 of 17

Title: EXTRACTION OF SEMIVOLATILE ORGANICS FROM SOLIDS BY SOXHLET EXTRACTION
(Base, Neutral, Acid Organics; Pesticides, Polychlorinated Biphenyls, and Diesel Range Organics)

METHOD REFERENCE: SW-846, Method 3540C (Revision 3, December 1996),

Applicable Matrices: Soils, Sediments, Sludges, Cables (Wires) and Waste

REVISED SECTIONS: NEW SOP

1.0 Scope and Application.

- 1.1 This method describes the extraction procedure of semi-volatile organic compounds (Base, Neutral, Acid Organics; Pesticides, Polychlorinated Biphenyls and Diesel Range Organics) in soil, sludge, wipes and other solid matrices for analysis by gas chromatograph/mass spectrometer (GC/MS) or gas chromatography/electron capture detector (GC/ECD).
- 1.2 This method is applicable for water-insoluble and slightly water-soluble organic compounds

2.0 Summary

- 2.1 A 30-gram aliquot of sample is mixed with anhydrous sodium sulfate to form a free-flowing powder. Wipe samples are extracted in their entirety, without weighing. The sample/sodium sulfate mixture is then placed in an extraction thimble and covered with a plug of glass wool. The sample is extracted with the appropriate solvent in a Soxhlet extractor. The mixture is extracted with methylene chloride, or methylene chloride/Acetone (1:1). The extract is decanted and concentrated for analysis using instrumental techniques using SW-846 Methods 8081, 8082, 8015 and 8270. Where necessary, solvent exchange from methylene chloride to hexane is performed prior to analysis to accommodate instrument detectors
- 2.2 The extract is then dried, concentrated and if required cleaned up, prior to instrumental analysis.
- 2.3 All Quality Control samples such as, MS/MDS, Method blank, and LCS/LCSD must be subjected to the same clean up treatment as the samples.

3.0 Reporting Limit and Method Detection Limit

- 3.1 See determinative method.

4.0 Definitions

BLANK - an analytical sample designed to assess specific sources of laboratory contamination. See individual types of Blanks: Method Blank, Instrument Blank, Storage Blank, and Sulfur Blank.

KUDERNA DANISH – A three-stage glass solvent concentration device consisting of a large volume receiving flask (250 or 500ml), a small volume concentrator tube and a three-ball air cooled condenser. Use this device to

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TEST NAME: SW846 8082: DETERMINATION OF POLYCHLORINATED BIPHENYLS (PCBs) USING GC SYSTEM

REVISED SECTIONS: 10.1.7, 10.2.2, & 10.2.2.1

METHOD REFERENCE: SW 846 8082 (Revision 0, December 1996)

1.0 SCOPE AND APPLICATION

- 1.1 This SOP describes the analytical procedures, which are utilized by Accutest to acquire samples for analysis of polychlorinated biphenyls (PCBs) as Aroclors, using dual open-tubular capillary columns with electron capture detectors (ECD).
- 1.2 This gas chromatographic (GC) method is applicable to the determination of the PCB Aroclors listed in Table 1 in extracts from solid and aqueous matrices.

2.0 SUMMARY OF METHOD

- 2.1 A measured volume or weight of sample (approximately 1 L for liquids, 30 g for solids) is extracted using the appropriate matrix-specific sample extraction technique. Aqueous samples are extracted at neutral pH with methylene chloride using Method 3510 (separatory funnel). Solid samples are extracted with methylene chloride (50:50 methylene chloride-acetone or 50:50 hexane-acetone may also be used) using Method 3550 (ultrasonic extraction). A variety of cleanup steps may be applied to the extract, depending on the nature of the matrix interferences and the target analytes. Cleanups include sulfur (Method 3660).
- 2.2 Extracts for PCB analysis may be subjected to a sulfuric acid/potassium permanganate cleanup (Method 3665) designed specifically for these analytes. This cleanup technique will remove (destroy) many single component organochlorine or organophosphorus pesticides.
- 2.3 After cleanup, the extract is analyzed by injecting a 1 to 4- μ L aliquot into a gas chromatograph with dual narrow bore fused silica capillary columns and electron capture detectors (GC/ECD). The chromatographic data may be used to determine the seven Aroclors in Table 1.
- 2.4 The peaks detected are quantitated by comparison to retention times specific to the known target list of PCBs on two different column types (primary and confirmation).
- 2.5 Once identified, the Aroclor is quantitated by external standard techniques with an average calibration factor generated from a calibration curve.

3.0 REPORTING LIMIT AND METHOD DETECTION LIMIT

- 3.1 Reporting Limit (RL). The reporting limit for this method is established at the lowest concentration standard in the calibration curve. RLs may vary depending on matrix difficulties and sample volumes or weight and percent moisture. Refer to Table 1 for current reporting limits.

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3.2 Method Detection Limit (MDL). Experimentally determine MDLs using the procedure specified in 40 CFR, Part 136, Appendix B. This value represents the lowest reportable concentration of an individual compound that meets the method qualitative identification criteria.

3.2.1 Experimental MDLs must be determined annually for this method.

3.2.2 Process all raw data for the replicate analysis in each MDL study. Forward the processed data to the QA group for archiving.

4.0 DEFINITIONS

BLANK - an analytical sample designed to assess specific sources of laboratory contamination. See individual types of Blanks: Method Blank, Instrument Blank, Storage Blank and Sulfur Blank.

CALIBRATION FACTOR (CF) - a measure of the gas chromatographic response of a target analyte to the mass injected. The calibration factor is analogous to the Relative Response Factor (RRF) used in the Volatile and Semivolatile fractions.

CONTINUING CALIBRATION - analytical standard run every 12 hours, or every 10 samples and at the end of analytical sequence to verify the initial calibration of the system.

INITIAL CALIBRATION - analysis of analytical standards for a series of different specified concentrations; used to define the linearity and dynamic range of the response of the electron capture detector to the target compounds.

MATRIX - the predominant material of which the sample to be analyzed is composed. For the purpose of this SOP, a sample matrix is either water or soil/sediment. Matrix is not synonymous with phase (liquid or solid).

MATRIX SPIKE - aliquot of a matrix (water or soil) fortified (spiked) with known quantities of specific compounds and subjected to the entire analytical procedure in order to indicate the appropriateness of the method for the matrix by measuring recovery.

MATRIX SPIKE DUPLICATE - a second aliquot of the same matrix as the matrix spike (above) that is spiked in order to determine the precision of the method.

METHOD BLANK - an analytical control consisting of all reagents, and surrogate standards (or SMCs for VOA), that is carried throughout the entire analytical procedure. The method blank is used to define the level of laboratory, background and reagent contamination.

METHOD DETECTION LIMITS (MDLs) - MDLs should be established for all appropriate methods, using a solution spiked at approximately 3 times the established detection limit. To determine the MDL values, take seven replicate aliquots of the spiked sample and process through the entire analytical method. The MDL is calculated by multiplying the standard deviation of seven replicate analyses by 3.14, which is the (t) value for replicates at 99% confidence level. MDLs should be determined once per year for frequently analyzed parameters.

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PERCENT DIFFERENCE (%D) - As used in this SOP and elsewhere to compare two values, the percent difference indicates both the direction and the magnitude of the comparison, i.e., the percent difference may be either negative, positive, or zero. (In contrast, see relative percent difference.)

PERCENT MOISTURE - an approximation of the amount of water in a soil/sediment sample made by drying an aliquot of the sample at 105°C. The percent moisture determined in this manner also includes contributions from all compounds that may volatilize at or below 105 °C, including water. Percent moisture may be determined from decanted samples and from samples that are not decanted.

REAGENT WATER - water in which an interferant is not observed at or above the minimum detection limit of the parameters of interest.

RELATIVE PERCENT DIFFERENCE (RPD) - As used in this SOP and elsewhere to compare two values, the relative percent difference is based on the mean of the two values, and is reported as an absolute value, i.e., always expressed as a positive number or zero. (In contrast, see percent difference.)

RELATIVE RESPONSE FACTOR (RRF) - a measure of the instrument response of an analyte. Response Factors are determined by analysis of standards and are used in the calculation of concentrations of analytes in samples.

RETENTION TIME (RT) - the time required (in minutes) for a standard compound to elute from a chromatographic column.

SURROGATES - for semivolatiles and pesticides/Aroclors, compounds added to every blank, sample, matrix spike, matrix spike duplicate, and standard; used to evaluate analytical efficiency by measuring recoveries. Surrogates are brominated, fluorinated, or isotopically labeled compounds not expected to be detected in environmental media.

5.0 HEALTH & SAFETY

- 5.1 The analyst should follow normal safety procedures as outlined in the Accutest Health and Safety Plan and Personal Protection Policy, which includes the use of safety glasses and lab coats. In addition, all acids are corrosive and should be handled with care. Flush spills with plenty of water. If acids contact any part of the body, flush with water and contact the supervisor.
- 5.2 The toxicity or carcinogenicity of each reagent used in this method has not been precisely determined; however, each chemical should be treated as a potential health hazard. Exposure to these reagents should be reduced to the lowest possible level. The laboratory is responsible for maintaining a current awareness file of OSHA regulations regarding the safe handling of the chemicals specified in this procedure. A reference file of data handling sheets should be made available to all personnel involved in these analyses.
- 5.3 Polychlorinated biphenyls have been classified as known or suspected human or mammalian carcinogens. Primary standards of these toxic compounds should be prepared in a hood.

6.0 INTERFERENCES

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- 6.1 The data from all blanks, samples, and spikes must be evaluated for interferences.
- 6.2 Cross-contamination of clean glassware routinely occurs when plastics are handled during extraction steps, especially when solvent-wetted surfaces are handled. Glassware must be scrupulously cleaned. Refer to "The Preparation of Glassware for Extraction of organic contaminants" SOP for practices utilized in the extraction department.
- 6.3 Interferences may be caused by contaminants that are co-extracted from the sample. The extent of the interferences will vary from source to source, which can be grouped into three broad categories.
 - 6.3.1 Contaminated solvents, reagents, or sample processing hardware.
 - 6.3.2 Contaminated GC carrier gas, parts, column surfaces, or detector surfaces.
 - 6.3.3 Compounds extracted from the sample matrix to which the detector will respond.
- 6.4 Interferences by phthalate esters introduced during sample preparation can pose a major problem in PCB determination.
 - 6.4.1 Common flexible plastics contain varying amounts of phthalate esters, which are easily extracted or leached from such materials during laboratory operations. Avoiding contact with any plastic materials and checking all solvents and reagents for phthalate contamination can best minimize interference from phthalate esters.
 - 6.4.2 Exhaustive cleanup of solvents, reagent and glassware may be required to eliminate background phthalate ester contamination.
 - 6.4.3 These materials can be removed through the use of Method 3665 (sulfuric acid cleanup procedure).
- 6.5 Elemental sulfur is readily extracted from soil samples and may cause chromatographic interferences in the determination of PCBs. Method 3660 is suggested for removal of sulfur.
- 6.6 To reduce carryover when high-concentration samples are sequentially analyzed, the syringe must be rinsed out between samples with solvent. Whenever an unusually concentrated sample is encountered, it should be followed by the analysis of solvent to check for cross contamination.

7.0 SAMPLE PRESERVATION AND HOLDING TIME

7.1 PRESERVATION

7.1.1 Water Samples

- 7.1.1.1 Collect samples in 1 liter glass amber bottles without preservatives.
- 7.1.1.2 A liter of an unpreserved sample is required for extraction. Additional sample volume is necessary for any samples used for matrix spike and matrix spike duplicates. Therefore, 3 liters of at least one sample in every group of 20 field

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samples are required for analysis to accommodate all quality control requirements.

7.1.2 Soil Samples

7.1.2.1 Samples are collected in a clear 300 ml glass sample jar. No preservative is required.

7.1.3 Sample should be collected and handled with care to prevent any portion of the sample coming in contact with the sampler's gloves, thus causing possible phthalate contamination.

7.1.4 The samples must be protected from light and refrigerated at $<6^{\circ}\text{C}$ from the time of receipt until extraction and analysis.

7.2 HOLDING TIME

7.2.1 Aqueous samples must be extracted within 7 days of sampling.

7.2.2 Soil samples must be extracted within 14 days of sampling.

7.2.3 Extracts must be analyzed within 40 days following extraction.

8.0 APPARATUS AND MATERIALS

8.1 GAS CHROMATOGRAPH SYSTEM

8.1.1 Gas Chromatograph-Hewlett Packard Model 5890 and 6890N. The analytical system complete with a temperature programmable gas chromatograph and all required accessories including syringes, analytical columns, and gases. The injection port is designed for splitless injection with capillary columns. The capillary columns are directly coupled to the detectors.

8.1.2 Columns

8.1.2.1 Column pair 1

8.1.2.1.1 30 m x 0.32 mm fused silica (0.5 μm film thickness) DB-1701 narrow-bore capillary column or equivalent.

8.1.2.1.2 30 m x 0.32 mm fused silica (0.5 μm film thickness) DB-17 narrow-bore capillary column or equivalent.

8.1.2.2 Column pair 2

8.1.2.2.1 30 m x 0.32 mm fused silica (0.5 μm film thickness) RTX CLPI narrow-bore capillary column or equivalent.

8.1.2.2.2 30 m x 0.32 mm fused silica (0.25 μm film thickness) RTX CLPII narrow-bore capillary column or equivalent.

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8.1.3 Detectors

8.1.3.1 Electron Capture Detectors (HP).

8.2 AUTOSAMPLER

8.2.1 Hewlett Packard Model 7673A, and 7673B capable of holding 100 of 2-ml crimp vials.

8.3 DATA SYSTEM

8.3.1 HP Chemstation, interfaced to the gas chromatograph which allows the continuous acquisition and storage on machine readable media (disc) of all chromatographic data obtained throughout the duration of the analysis.

8.3.2 The ENVIROQUANT data system is capable of quantitation using multi-point calibration.

8.3.3 Lagato Networker with lookup database on 4mm DAT tape for long term, off line magnetic storage of data.

8.4 SYRINGE

8.4.1 10, 50, 100 250, 500 μ l and 1ml graduated and calibrated quarterly, manually held (Hamilton or equiv.).

8.4.2 10 μ l graduated, auto sampler (Hamilton or equiv.).

9.0 REAGENTS AND STANDARDS

9.1 Refer to Accutest Sample Preparation SOPs for Semi-Volatile Extractables in Aqueous and Extraction of Semi-Volatile Organics from Solids by Sonication for reagents and standards used for sample extraction.

9.2 Solvents - Ultra pure, chromatography grade Hexane.

9.3 Stock Standard Solutions. Certified, commercially prepared standards, from two separate sources are used

9.3.1 Aroclor Standards:

9.3.1.1 Aroclors 1016, 200ppm – Supelco (or equivalent)

9.3.1.2 Aroclors 1221, 200ppm – Supelco (or equivalent)

9.3.1.3 Aroclors 1232, 200ppm – Supelco (or equivalent)

9.3.1.4 Aroclors 1242, 200ppm – Supelco (or equivalent)

9.3.1.5 Aroclors 1248, 200ppm – Supelco (or equivalent)

9.3.1.6 Aroclors 1254, 200ppm – Supelco (or equivalent)

9.3.1.7 Aroclors 1260, 200ppm – Supelco (or equivalent)

9.3.1.8 Aroclors 1268, 1000ppm-Absolute standards (or equivalent)

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9.3.1.9 Pesticide Surrogate Standard Spike Solution, 200ppm – Supleco (or equivalent)

9.3.2 Second Source Standard:

- 9.3.2.1 Aroclors 1016, 1000ppm – Ultra Scientific (or equivalent)
- 9.3.2.2 Aroclors 1221, 100ppm – Ultra Scientific (or equivalent)
- 9.3.2.3 Aroclors 1232, 100ppm – Ultra Scientific (or equivalent)
- 9.3.2.4 Aroclors 1242, 100ppm – Ultra Scientific (or equivalent)
- 9.3.2.5 Aroclors 1248, 100ppm – Ultra Scientific (or equivalent)
- 9.3.2.6 Aroclors 1254, 100ppm – Ultra Scientific (or equivalent)
- 9.3.2.7 Aroclors 1260, 1000ppm – Ultra Scientific (or equivalent)
- 9.3.2.8 Aroclors 1268, 1000ppm – Accustandard (or equivalent)
- 9.3.2.9 Pesticide Surrogate Standard Spike Solution, 100ppm – Ultra Scientific (or equivalent)

9.4 Working Solutions

9.4.1 Prepare working solutions, using stock solution, in hexane, as needed, that contain the compounds of interest, either singly or mixed together. Refer to Table 3A, 3B for details.

9.5 Calibration Standards

9.5.1 Initial Calibration Standards

9.5.1.1 A standard containing a mixture of Aroclor 1016 and Aroclor 1260 will include many of the peaks in the other six Aroclor mixtures. As a result, a multi-point calibration employing a mixture of Aroclors 1016 and 1260 at five concentrations should be sufficient to demonstrate the linearity of the detector response without the necessity of performing initial calibration for each of the eight Aroclors. Prepare a minimum of five calibration standards containing equal concentrations of both Aroclor 1016 and Aroclor 1260, including surrogates, by dilution of the above working solutions (Section 9.4) with hexane. Suggested levels and preparations are shown in Table 4A.

9.5.1.2 Separate calibration standards are required for the other six Aroclors. Unless otherwise necessary for a specific project, a single calibration standard near the mid-point of the expected calibration range of each remaining Aroclor is employed to determine its calibration factor. Refer to Table 4B for preparation scheme. Optional curves as shown on Table 4C may also be used for a multi-point calibration per project's specification.

9.5.2 Continuing Calibration Checks

9.5.2.1 For Aroclor analyses, the continuing calibration checks should be a mixture of Aroclor 1016 and Aroclor 1260. Two standards at 200 µg/l and 300 µg/l are prepared as described in Table 5A. During the analysis, these two solutions are alternated to check the initial calibration.

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9.5.2.2 In situations where only a few Aroclors are of interest for a specific project, the calibration checks of each Aroclor of interest may be prepared (Table 5B) and analyzed at the same intervals as the 1016/1260 mixture throughout the analytical sequence.

9.6 Second Source Calibration Check Standard

- 9.6.1 Prepare the second source calibration check standards from separate sources of stock standards from the calibration curve following the procedures in Table 6A and 6B.
- 9.6.2 The second source calibration check standard is prepared at 200 µg/l for Aroclors 1260/1016 and is only analyzed when initial calibration is performed. Recoveries for the second source standard should fall between 75-125% for all target analytes when calculated against the initial calibration. If the second source standard fails for any of the target analytes, prepare a second standard for re-analysis, if the second try fails again, the analyst will investigate the nature of the problem and determine if a new initial calibration is needed.

9.7 Surrogates

- 9.7.1 Tetrachloro-m-xylene (TCMX) and decachlorobiphenyl (DCB) are used as surrogate standards for this method.
- 9.7.2 A calibration range must be constructed for the surrogate compounds. Accordingly, appropriate amounts of surrogates are mixed with each calibration solution to define a range similar to the target compounds.
- 9.7.3 Surrogate compounds are also contained in the continuing calibration checks.
- 9.7.4 Spike each sample, QC sample and blank with an appropriate amount of corresponding surrogate spiking solution, prior to extraction, for a final concentration in the extract of 100 µg/l of each surrogate compound.

9.8 Storage of Standards

- 9.8.1 Store unopened stock standard solutions according to the manufacturer's documented holding time and storage temperature recommendations. Protect from light.
- 9.8.2 Store all other working standard solutions in glass vials with Teflon lined screw caps at 4°C (± 2°C) in the dark.
- 9.8.3 Opened stock standard solutions must be replaced after one year or sooner if manufacturer's expiration date comes first or comparison with quality control check samples indicates a problem.
- 9.8.4 All other standards must be replaced after six months or sooner if routine QC indicates a problem or manufacturer's expiration date comes first.

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10.0 CALIBRATION

10.1 Initial Calibration

10.1.1 The method reporting limit is established by the concentration of the lowest standard analyzed during the initial calibration. Lower concentration standard may be needed to meet the reporting limit requirements of state specific regulatory program. The linear range covered by this calibration is the highest concentration standard.

10.1.2 The initial calibration for this method consists of two parts, described below.

10.1.2.1 A standard containing a mixture of Aroclor 1016 and Aroclor 1260 will include many of the peaks represented in the other six Aroclor mixtures. Thus, such a standard may be used to demonstrate the linearity of the detectors and that a sample does not contain peaks that represent any one of the Aroclors. This standard can also be used to determine the concentrations of either Aroclor 1016 or Aroclor 1260, should they be present in a sample. The calibration range covered for Aroclor 1016 and Aroclor 1260 employs standards of 50, 100, 200, 300, 400, 500 and 1,000 µg/l.

10.1.2.2 Standards of the other six Aroclors are necessary for pattern recognition. These standards are also used to determine a single-point calibration factor for each Aroclor, assuming that the Aroclor 1016/1260 mixtures in Section 10.1.2.1 has been used to describe the detector response. The concentration of each Aroclor standard is near the mid-point of the linear range of the detector, usually at 200 µg/l. The standards for these six Aroclors should be analyzed before the analysis of any samples, and may be analyzed before or after the analysis of those 1016/1260 standards.

10.1.2.3 In situations where only a few Aroclors are of interest for a specific project, an initial calibration of a minimum of five standards of each Aroclor of interest instead of the 1016/1260 mixture may be performed.

10.1.3 A calibration range must be constructed for each surrogate compound. Accordingly, add appropriate amounts of each surrogate compound to the calibration solution to define a range similar to the target compounds.

10.1.4 Aliquot proper amount of each calibration standard into a 2 ml crimp top vial.

10.1.5 PCBs are quantitatively determined as Aroclors by the external standard technique. The Calibration Factor (CF) for each characteristic Aroclor peak in each of the initial calibration standards is calculated using the equation in Section 14.1.

10.1.5.1 Use at least five peaks for the Aroclor 1016/1260 mixture, none of which should be found in both of these Aroclors. At least five sets of calibration factors will be generated, each set consisting of the calibration factors for each of the five (or more) peaks chosen for this mixture.

10.1.5.2 A minimum of 3 characteristic peaks must be chosen for each of the other Aroclors, and preferably 5 peaks. The peaks must be characteristic of the

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Aroclor in question. Thus, each single standard will generate at least three calibration factors, one for each selected peak.

10.1.5.3 Choose peaks in the Aroclor standards that are at least 25% of the height of the largest Aroclor peak. For each Aroclor, the set of 3 to 6 peaks should include at least one peak that is unique to that Aroclor.

10.1.6 The calibration factors from the initial calibration are used to evaluate the linearity of the initial calibration. When the Aroclor 1016/1260 mixture is used to demonstrate the detector response, the calibration model chosen for this mixture must be applied to the other six Aroclors for which only single standards are analyzed. If multi-point calibration is performed for individual Aroclors, use the calibration factors from those standards to evaluate linearity.

10.1.7 For the initial calibration to be valid, the percent relative standard deviation (% RSD) (see Section 14.2) must be $\leq 20\%$ for each Aroclor of interest. If any analyte exceeds the 20% acceptance limit for a given calibration, corrective action must be taken.

10.1.8 If the %RSD $< 20\%$ linearity through the origin can be assumed and the mean CF can be used to quantitate Target analytes in the samples. Alternatively if the %RSD $> 20\%$ a calibration curve of responses vs. amount can be plotted. A linear curve can be used if the correlation coefficient (r) is > 0.995 a minimum of five points is required. A quadratic curve can also be used if the correlation coefficient (r^2) is > 0.990 a minimum of six points required.

10.1.8.1 If the problem is associated with a single standard, reanalyze the standard and recalculate the RSD.

10.1.8.2 Alternatively, narrow the calibration range by replacing one or more of the calibration standards that cover a narrow range.

10.1.6.2.1 The changes to the upper end of the calibration range will affect the need to dilute samples above the range, while changes to the lower end will affect the overall sensitivity of the method. Consider the regulatory limits or action levels associated with the target analytes when adjusting the lower end of the range.

10.2 Second Source Calibration Check Standard

10.2.1 The initial calibration is verified with a second source calibration check standard from an external source (Section 9.6). It must be performed right after the initial calibration.

10.2.2 The percent difference (%D) (Section 14.3) for this standard must meet the %D criteria of 15% used for calibration verification.

10.2.2.1 If %D is greater than 15%, reanalyze the second source check. If the limit cannot be met upon re-injection, re-prepare the second source solution using a fresh ampoule and repeat the process.

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10.2.2.2 If the %D criteria cannot be achieved after re-preparation of the second source, prepare a third source and repeat the process. Make fresh calibration standards using one of the two standard sources that matches each other.

10.3 Continuing Calibration Checks (CC)

10.3.1 Continuing calibration check standards (Section 9.5.2) must be acquired at the beginning of each 12-hour shift or every 10 injections, whichever comes first and at the end of the analysis sequence. The 200 µg/l check standard is alternated with 300 µg/l standard for calibration verification.

10.3.2 For Aroclor analyses, the calibration verification standard should be a mixture of Aroclor 1016 and Aroclor 1260. The calibration verification process does not require analysis of the other Aroclor standards used for pattern recognition, but the analyst may wish to include a standard for one of these Aroclors after the 1016/1260 mixture used for calibration verification throughout the analytical sequence.

10.3.3 The percent difference (%D) (see section 14.3) must be $\leq 15\%$ for each Aroclor of interest.

10.3.4 Each sample analysis must be bracketed by periodic analyses of acceptable calibration verification standards (each 12-hour analytical shift). If %D criteria fails during a mid sequence calibration check or at the end of the analysis sequence, a continuing calibration check is allowed to be repeated only once; if the second trial fails, a new initial calibration must be performed. In situations where the first check fails to meet the criteria, the instrument logbook should have clear documented notations as to what the problem was and what corrective action was implemented to enable the second check to pass.

10.3.5 When a calibration verification standard fails to meet the QC criteria at the end of the analysis sequence, all samples injected after the last standard that last met the QC criteria must be evaluated to prevent mis-quantitations, and re-injection of the sample extracts may be required.

10.3.5.1 If no analyte was detected in the specific samples analyzed during the analytical shift, then the extracts for those samples do not need to be reanalyzed when the calibration standard response is above the initial calibration response.

10.3.5.2 If the analyte was detected in the specific samples analyzed during the analytical shift, or if the calibration standard response is below the initial calibration response, then the extracts for those samples need to be reanalyzed.

10.3.6 Each subsequent injection of a continuing calibration standard during the 12-hour analytical shift must be checked against the retention time windows established in Section 11.0. If any of these subsequent standards fall outside their absolute retention time windows, the GC system is out of control. Determine the cause of the problem and correct it. If the problem cannot be corrected, a new initial calibration must be performed.

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11.0 RETENTION TIME WINDOWS

- 11.1 Absolute retention times are used for the identification of PCBs as Aroclors. Retention time windows must be calculated for each surrogate and at least 3 to 5 characteristic peaks of each Aroclor on each GC column and whenever a new chromatographic column is installed, or when there are significant changes in the operating conditions. The retention time windows must be reported with the analysis results in support of the identifications made.
- 11.2 Employ the following approach to establish retention time windows:
- 11.2.1 Make three injections of each Aroclor at approximately equal intervals during the 72-hr period.
 - 11.2.2 For each Aroclor, choose three or five major peaks and calculate the mean and standard deviation of the three retention times for that peak. The peak chosen should be fairly immune to losses due to degradation and weathering in the samples. Record the retention time to three decimal places (e.g. 10.015 min) for each Aroclor.
 - 11.2.3 In those cases where the standard deviations of the retention time window for a particular Aroclor is 0.000 minutes, the laboratory may either collect data from additional injections of standards or use a default standard deviation of 0.01 minutes.
 - 11.2.4 Apply plus or minus three times the standard deviations to retention time of each Aroclor standard (continuing calibration or middle level of initial calibration). This will be used to define the retention time window for the sample.
 - 11.2.4.1 If default standard deviation of 0.01 minutes is employed, the width of the window will be ± 0.03 minutes.
 - 11.2.5 Establish the center of the retention time window for each Aroclor and surrogate by using the absolute retention time for each Aroclor and surrogate from the calibration verification standard at the beginning of the analytical shift. For samples run during the same shift as an initial calibration, use the retention time of the mid-point standard of the initial calibration.

12.0 PROCEDURE

12.1 Sample Extraction

- 2.1.1 In general, water samples are extracted at a neutral pH with methylene chloride using a separate funnel (Method 3510) (Refer to SOP: TOP001). Solid samples are extracted with methylene chloride (50:50 methylene chloride-acetone or 50:50 hexane-acetone may also be used) using Method 3550 (ultrasonic extraction). A variety of cleanup steps may be applied to the extract, depending on the nature of the matrix interferences and the target analytes. Cleanups include sulfur (Method 3660).
- 2.1.2 Oil and waste samples are generally extracted by diluting 1 g of sample in 10 ml of Hexane, followed by cleanup procedures.

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12.2 Sample Cleanup

12.2.1 Cleanup procedures may not be necessary for a relatively clean sample matrix, but most extracts from environmental and waste samples will require additional preparation before analysis. The specific cleanup procedure used will depend on the nature of the sample to be analyzed and the data quality objectives for the measurements. Refer to appropriate SOPs for details.

12.2.1.1 Interferences by phthalate esters can be removed through the use of sulfuric acid/potassium permanganate cleanup (Method 3665) designed specifically for PCBs. This method should be used whenever elevated baselines or overly complex chromatograms prevent accurate quantitation of PCBs.

12.2.1.2 Element sulfur, which may be present in certain sediments and industrial wastes, interfere with the Electron Capture gas chromatography of certain Aroclors. Sulfur should be removed by the technique described in Method 3660.

12.3 Instrument conditions

12.3.1 Recommended instrument conditions are listed in Table 2. Modifications of parameters specified with an asterisk are allowed as long as criteria of calibration are met. Any modification should be approved by team leader/manager.

12.4 Initial calibration

12.4.1 Refer to Section 10.1.

12.5 Second source calibration check standard

12.5.1 Refer to Section 10.2.

12.6 Continuing calibration checks

12.6.1 Refer to Section 10.3.

12.7 Sample analysis (Primary)

12.7.1 All samples and quality control samples are injected into the Gas Chromatograph using the autosampler. Program the autosampler for an appropriate number of syringe rinses and a 4 µl injection volume. A splitless injection technology is used.

12.7.2 Sample concentrations are calculated by comparing sample responses with the initial calibration of the system (Section 14.4). If sample response exceeds the limits of the initial calibration range, dilute the extract and re-analyze. Extracts should be diluted so that all peaks are on scale, as overlapping peaks are not always evident when peaks are off scale.

12.7.3 Sample injections may continue for as long as the calibration verification standards and standards interspersed with the sample meet instrument QC requirements. The

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sequence ends when the set of samples has been injected or when qualitative and/or quantitative QC criteria are exceeded.

- 12.7.4 If the peak response is less than 2.5 times the baseline noise level, the validity of the quantitative result may be questionable. The analyst should consult with the source of the sample to determine whether further concentration of the sample is warranted.
- 12.7.5 If compound identification or quantitation is precluded due to interference (e.g., broad, rounded peaks or ill-defined baselines are present) cleanup of the extract or replacement of the capillary column or detector is warranted. Rerun the sample on another instrument to determine if the problem results from analytical hardware or the sample matrix.
- 12.7.6 When quantitating insulating oil, the analyst must pay close attention to surrogate recoveries and peak shapes. If either the surrogate has recoveries below 15% and/or there is a detected PCB in the sample, the analyst must proceed to dilute the extract and re-analyze, in order to determine the quenching effect of the oil.
- 12.8 Confirmation analysis.
- 12.8.1 Confirmation analysis is to confirm the presence of Aroclors tentatively identified in the primary analysis.
- 12.8.1.1 All instrument performance quality control criteria for calibration and retention time must be satisfied on the confirmation analysis.
- 12.8.2 Each tentative identification must be confirmed: using a second GC column of dissimilar stationary phase (as in the dual-column analysis), based on a clearly identifiable Aroclor pattern, or using another technique such as GC/MS.
- 12.8.2.1 The primary and secondary analysis is conducted simultaneously in the dual-column analysis.
- 12.8.2.2 GC/MS confirmation may be used in conjunction with dual-column analysis if the concentration is sufficient for detection in GC/MS, normally a concentration of approximately 10 ng/μl in the final extract for each Aroclor is required. Method 8270 is recommended as a confirmation technique when sensitivity permits.
- 12.8.3 Once the identification has been confirmed, the agreement between the quantitative results on both columns should be checked.
- 12.9 Sample Dilution
- 12.9.1 Establish dilution of sample in order to fall within calibration range or to minimize the matrix interference.
- Utilize screen data (specific project only).
 - Utilize acquired sample data.
 - Utilize the history program or approval from client/project.
 - Sample characteristics (appearance, odor).

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12.9.2 If no lower dilution has been reported, the dilution factor chosen should keep the response of the largest peak for a target analyte in the upper half of the initial calibration range of the instrument.

12.9.3 Preparing Dilutions.

12.9.3.1 Prepare sample dilutions quantitatively. Dilute the sample extract with hexane using logical volume to volume ratios, i.e., 1:5, 1:10, 1:50, etc.

12.9.3.2 Syringe Dilutions – For dilutions a 2ml vial and a calibrated 1ml syringe may be used.

Sample Dilution Guide

1:2	500ul sample, 500ul dilution solvent
1:4	250ul sample, 750ul dilution solvent
1:5	200ul sample, 800ul dilution solvent
1:10	100ul sample, 900ul dilution solvent

Gently shake to disperse the extract throughout the solvent, prior to loading onto the auto-sampler tray for further analysis.

12.10 Data interpretation

12.10.1 Qualitative identification

12.10.1.1 Analyst shall identify the target analytes with competent knowledge interpreting retention time and/or chromatographic pattern by comparison of the sample to the standard of the suspected Aroclor. The criteria required for a positive identification are:

12.10.1.1.1 The quantitation of PCB residues as Aroclors is accomplished by comparison of the sample chromatogram to that of the most similar Aroclor standard. A choice must be made as to which Aroclor is most similar to that of the residue and whether that standard is truly representative of the PCBs in the sample.

12.10.1.1.2 The target analytes must elute within the daily absolute retention time window on both primary and confirmation column.

12.10.1.1.3 For PCBs, at least five major peaks are selected. The retention time window for each peak is determined from the initial calibration analysis. This identification of PCBs as Aroclors is based on agreement between the retention times of peaks in the sample chromatogram with the retention time windows established through the analysis of standards of multi-component target analytes. Tentative identification of an analyte occurs when a peak from a sample extract falls within the established retention time window for a specific target analyte.

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- 12.10.1.1.4 Be aware of matrix interfering effects on peak shape and relative peak ratios, which could distort the pattern. Interpretation of this phenomenon may require a highly experienced analyst or at least a second opinion.

12.10.2 Quantitative analysis

- 12.10.2.1 Once the Aroclor pattern has been identified, compare the responses of at least 3 major peaks in the single-point calibration standard for that Aroclor with the peaks observed in the sample extract. The amount of Aroclor is calculated using the individual calibration factor for each corresponding peak and the linear calibration established from the multi-point calibration of the 1016/1260 mixture. A concentration (see section 14.4) based on the integrated area/or height of each of the characteristic peaks is determined and then those resulting concentrations are averaged to provide the final result for the sample.
- 12.10.2.2 Weathering of PCBs in the environment and changes resulting from waste treatment processes may alter the PCBs to the point that the pattern of a specific Aroclor is no longer recognizable. The quantitation may then be performed by measuring the total area of the PCB pattern and quantitating on the basis of the Aroclor standard that is most similar to the sample. Any peaks that are not identifiable as PCBs on the basis of retention times should be subtracted from the total area. When quantitation is performed in this manner, the problems should be fully described for the data user and the specific procedures employed by the analyst should be thoroughly documented.
- 12.10.2.3 When sample results are confirmed using two dissimilar columns or with two dissimilar detectors, the agreement between the quantitative results must be evaluated after the identification has been confirmed. Calculate the relative percent difference (RPD) between the two results using the formula in Section 14.6.
- 12.10.2.3.1 A program to perform the RPD calculation had been developed and incorporated into ENVIROQUANT software. Whenever an analyte has a RPD exceeds 40% between the results on the primary and secondary columns, a "P" qualifier will be shown on the quantitation report next to its results.
- 12.10.2.3.2 If one result is significantly higher (e.g., >40%), check the chromatograms to see if an obviously overlapping peak is causing an erroneously high result. If no overlapping peaks are noted, examine the baseline parameters established by the instrument data system (or operator) during peak integration.
- 12.10.2.3.3 If no anomalies are noted, review the chromatographic conditions. If there is no evidence of chromatographic problems, report the result from the primary column with the footnote (remark) indicating

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“More than 40% RPD for detected concentrations between two GC columns”.

12.10.2.3.4 When reporting quantitative data from a dual column system, report the higher result . If one result is significantly higher (e.g., >40%), check the chromatograms to see if an obviously overlapping peak is causing an erroneously high result. If no overlapping peaks are noted, examine the baseline parameters established by the instrument data system (or operator) during peak integration. If no anomalies are noted, review the chromatographic conditions. If there is no evidence of chromatographic problems, report the higher result.

13.0 QUALITY CONTROL

13.1 QC Requirements Summary

Initial Calibration	Whenever needed
Second Source Calibration Check	Following initial calibration
Continuing Calibration Checks	Every 12-hour shift or after every 10 injections and at the end of analysis sequence
Method blank	One per extraction batch*
Blank Spike	one per extraction batch*
Matrix Spike	one per extraction batch*
Matrix Spike Duplicate	one per extraction batch*
Surrogates	every sample and standard

*The maximum number of samples per batch is twenty or per project specification.

13.2 Initial Calibration.

13.2.1 Refer to Section 10.1.

13.3 Second Source Calibration Check.

13.3.1 Refer to Section 10.2.

13.4 Continuing Calibration Checks.

13.4.1 Refer to Section 10.3.

13.5 Method Blank.

13.5.1 The method blank is either DI water or sodium sulfate (depending upon the sample matrix) which must be extracted with each set of 20 or less samples. For a running batch, a new method blank is required for each different extraction day. The method

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blank should be carried through all stages of the sample preparation and measurement.

13.5.2 If the method blank contains a target analyte above its MDL, the entire batch must be re-extracted and reanalyzed. Exceptions can be made based on client specifications. Exceptions are documented in the case narrative and corrective action is unnecessary unless detected contamination has a negative effect on sample data.

13.5.3 Surrogate compounds are added to the method blank prior to extraction and analysis. If the surrogate accuracy in the blank does not meet in-house criteria using procedures documented in SOP TQA043, the entire batch must be re-extracted and reanalyzed. If the surrogates are biased high, all associated sample data can be reported if there are no hits detected in the samples.

13.6 Blank Spike.

13.6.1 A blank spike must be extracted with each set of 20 or less samples. For a running batch, a new blank spike is required for each different day. The blank spike consists of an aliquot of a clean (control) matrix similar to the sample matrix and of the same weight or volume. It is spiked with the same analyte at the same concentration as matrix spike. When the presence of specific Aroclors is not anticipated, the Aroclor 1016/1260 mixture may be appropriate choice for spiking. In situations where the other Aroclors are of interest for a specific project, the analyst may employ different spiking mixtures. The blank spike is prepared at a concentration of 200 µg/l or 200 µg/kg (on a dry weight basis) for each Aroclor.

13.6.2 The blank spike recoveries should be assessed using in house limits established using procedures documented in SOP TQA043.

13.6.3 If a blank spike is out of control, corrective action must be taken and all associated samples must be re-extracted and reanalyzed. The exception is if the blank spike recovery is high and no hits reported in associated samples and QC batch. In that case, the sample results can be reported with footnote (remark) and no further action is required.

13.7 Matrix Spike (MS) / Matrix Spike Duplicate (MSD).

13.7.1 One sample is randomly selected from each extraction batch and spiked in duplicate with select Aroclors to assess the performance of the method as applied to a particular matrix and to provide information on the homogeneity of the matrix. Both the MS and MSD are carried through the complete sample preparation, cleanup, and determinative procedures.

13.7.2 The MS and MSD should be spiked with the Aroclors of interest. If samples are not expected to contain target analytes, a matrix spike and matrix spike duplicate pair should be spiked with Aroclor 1016/1260 mixture. However, when specific Aroclors are known to be present or expected in samples, the specific Aroclor should be used for spiking.

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- 13.7.3 Matrix spikes are prepared by spiking an actual sample at a concentration 200 µg/l or 200 µg/kg on a dry weight basis.
- 13.7.4 Assess the matrix spike recoveries and relative percent difference (RPD) against the in house control limits established using procedures documented in SOP TQA043.
- 13.7.5 If the matrix spike accuracy of any individual Aroclor is out of control, the accuracy for that Aroclor in the blank spike must be within control. Matrix interference is assumed and the data is reportable. No further corrective action is required.
- 13.8 Surrogates.
 - 13.8.1 Tetrachloro-m-xylene (TCMX) and Decachlorobiphenyl (DCB) are used as surrogate standards. All blanks, samples, matrix spikes, and calibration standards contain surrogate compounds which are used to monitor performance of the extraction, cleanup (when used), and analytical system.
 - 13.8.2 The recoveries (Section 14.5) of the surrogates must be evaluated versus the surrogate control limits established using procedures documented in SOP TQA043 which are developed by the laboratory annually.
 - 13.8.3 If surrogate recoveries are not within established control limits, corrective action must be performed if surrogate recoveries indicate that a procedural error may have occurred during the analysis of the sample.
 - 13.8.3.1 Check the surrogate calculations for calculation or integration errors and perform corrections if detected.
 - 13.8.3.2 Reanalyze the extract if no calculation errors are detected. If the surrogate recoveries for the reanalyzed extract are in control, report the data from the reanalysis only.
 - 13.8.3.3 If the data from the reanalysis is also out of control, re-extract and reanalyze the sample.
 - 13.8.3.4 If, upon reanalysis, the surrogate recoveries are acceptable, report the reanalysis data. If the holding time has expired prior to the reanalysis, report both the original and reanalysis results and note the holding time problem.
 - 13.8.3.5 If the recovery is again not within limits, the problem is considered to be matrix interference. Submit both data sets with the original analysis being reported.
 - 13.8.4 The retention time shift for surrogate must be evaluated after the analysis of each sample. The sample must be reanalyzed when the retention times for both surrogates are outside the retention time window.

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13.8.4.1 Reanalyses are not required for samples having visible matrix interference, defined as excessive signal levels from target or non-target interfering peaks. This judgment should be approved by a supervisor.

14.0 CALCULATION

14.1 Calibration Factor (CF).

$$CF = \frac{A_s}{C_s}$$

where:

A_s = Area of the peak for the compound being measured.

C_s = Concentration of the compound being measured ($\mu\text{g/l}$).

14.2 Percent Relative Standard Deviation (% RSD).

$$\%RSD = \frac{SD}{CF_{av}} \times 100$$

where:

SD = Standard Deviation.

CF_{av} = Average calibration factor from initial calibration.

14.3 Percent Difference (% D).

$$\% D = \frac{|CF_{av} - CF_c|}{CF_{av}} \times 100$$

where:

CF_c = CF from continuing calibration (CBCHK).

14.4 Concentration (Conc.).

For water:

$$\text{Conc. } (\mu\text{g/l}) = \frac{A_c \times M}{CF_{av}}$$

$$M = \frac{V_f \times D}{V_i}$$

For soil/sediment (on a dry weight basis):

$$\text{Conc. } (\mu\text{g/kg}) = \frac{A_c \times M}{CF_{av}}$$

$$M = \frac{V_f \times D}{W_s \times S}$$

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where:

A_c = Area of peak for compound being measured.

V_f = Final Volume of total extract (ml).

D = Secondary dilution factor.

V_i = Initial volume of water extracted (ml).

W_s = Weight of sample extracted (g).

S = (100 - % moisture in sample) / 100 or % solid/100.

M = Multiplier.

14.5 Percent Recovery (% R).

$$\% R = \frac{\text{Concentration found}}{\text{Concentration spiked}} \times 100$$

14.6 Relative Percent Difference (RPD).

$$RPD = \frac{|C_1 - C_2|}{(1/2)(C_1 + C_2)} \times 100$$

where:

C_1 = Matrix Spike Concentration or the result on column 1.

C_2 = Matrix Spike Duplicate Concentration or the result on column 2.

15.0 DOCUMENTATION

15.1 The Analytical Logbook is a record of the analysis sequence; the logbook must be completed daily. Each instrument will have a separate logbook.

15.1.1 If samples require reanalysis, a brief explanation of the reason must be documented in this log. For consistency, if surrogates are high or low indicate it as (↑) for high and (↓) for low.

15.2 The Standard Preparation Logbook must be completed for all standard preparations. All information requested must be completed, the page must be signed and dated by the respective person.

15.2.1 The Accutest Lot Number must be cross-referenced on the standard vial.

15.3 The Instrument Maintenance Logbook must be completed when any type of maintenance is performed on the instrument. Each instrument will have a separate log.

15.4 Any corrections to laboratory data must be done using a single line through the error. The initials of the person and date of correction must appear next to the correction.

15.5 Unused blocks of any form must be x'ed and z'ed by the analyst before submitting the data for review.

15.6 Supervisory (or peer) personnel must routinely review (at least once per month) all laboratory logbooks to ensure that information is being recorded properly. Additionally, the

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maintenance of the logbooks and the accuracy of the recorded information should also be verified during this review.

16.0 DATA REVIEW AND REPORTING

- 16.1 Initial and continuing calibration check. Verify that all calibration and continuing calibration criteria have been achieved. If the criteria had not been achieved, corrective action must be performed to bring the system in control before analyzing any samples.
 - 16.1.1 If samples had been analyzed under non-compliant calibration criteria, all sample extracts must be re-analyzed once the system is brought into control.
- 16.2 Quality Control Data Review. Review all QC data. If QC criteria were not achieved, perform corrective action before proceeding with analysis.
 - 16.2.1 In some situation, corrective action may demand that the entire sample batch be re-extracted and re-analyzed before processing data.
- 16.3 Chromatogram Review. The chromatogram of each sample is evaluated for target analytes.
 - 16.3.1 Check specific retention time windows for each target compound for the presence of the target compound in each chromatogram.
 - 16.3.1.1 Each sample may require the reporting of different target analytes. Review the login to assure that the correct target compounds are identified.
 - 16.3.2 The Aroclor must be identified on the primary and confirmatory column before assigning a qualitative identification.
 - 16.3.3 Manual integration of chromatographic peaks must be identified by the analysts by creating a PDF file of before and after the integration.
- 16.4 Transfer to LIMS. Following the initial screen review, transfer the processed data to the LIMS.
 - 16.4.1 Print the processed data and compare the printed values to the original values to verify transfer accuracy.
 - 16.4.2 If transfer errors occurred, the errors must be corrected before the data is re-submitted.
- 16.5 Hardcopy Print & Data Package Assembly.
 - 16.5.1 After successful transfer is verified, approve the data and print a hard copy.
 - 16.5.2 Assemble the data package combining the LIMS output and instrumental data.
 - 16.5.3 Pass the entire package forward to the supervisor for final review and release approval.

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17.0 POLLUTION PREVENTION & WASTE MANAGEMENT

- 17.1 Users of this method must perform all procedural steps in a manner that controls the creation and/or escape of wastes or hazardous materials to the environment. The amounts of standards, reagents, and solvents must be limited to the amounts specified in this SOP. All safety practices designed to limit the escape of vapors, liquids or solids to the environment must be followed. All method users must be familiar with the waste management practices described in section 17.2.
- 17.2 Waste Management. Individuals performing this method must follow established waste management procedures as described in the waste management SOP, TSM003-03. This document describes the proper disposal of all waste materials generated during the testing of samples as follows:
- 17.2.1 Non hazardous aqueous wastes.
 - 17.2.2 Hazardous aqueous wastes
 - 17.2.3 Chlorinated organic solvents
 - 17.2.4 Non-chlorinated organic solvents
 - 17.2.5 Hazardous solid wastes
 - 17.2.6 Non-hazardous solid wastes

18.0 ADDITIONAL REFERENCES

- 18.1 No additional references are required for this SOP.

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Table 1. PCB Aroclors and Reporting Limits

Compound	CAS Number	Water (mg/l)	Soil (mg/kg)
Arochlor – 1016	12674-11-2	0.5	17
Arochlor – 1221	11104-28-2	0.5	17
Arochlor – 1232	11141-16-5	0.5	17
Arochlor – 1242	53469-21-9	0.5	17
Arochlor – 1248	12672-29-6	0.5	17
Arochlor – 1254	11097-69-1	0.5	17
Arochlor – 1260	11096-82-5	0.5	17

Table 2. RECOMMENDED OPERATING CONDITION

Gas Chromatograph/Electron Capture Detectors

Carrier Gas	Helium
Make-up gas	5 % Methane/ 95 % Argon
Make-up gas flow	*30 ml/min
Injection port temperature	*250 °C
<i>Injection type</i>	<i>Splitless</i>
<i>Detector temperature</i>	<i>*300 °C</i>
<i>Column flow</i>	<i>*5 ml/min</i>
Gas Chromatograph Temperature Program*	
Initial temperature	*110 °C
Time 1	*2 min
Column temperature rate 1	*30 degrees/min
Temperature 1	*180 °C
Column temperature rate 2	*3.5 degrees/min
Temperature 2	*240 °C
Column temperature rate 3	*10 degrees/min
Final temperature	*280 °C
Time 3	*5 min
Total run time	20-30 min

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* Parameter modification allowed for performance optimization as long as QC criteria are achieved.

Table 3A. Aroclors 1016/1260 Mixture and Surrogates Working Solution	
Stock Solution	Volume Added
Aroclor 1016 (1,000 µg/ml)	50 µl
Aroclor 1260 (1,000 µg/ml)	50 µl
Pesticides Surrogate Std Spiking Solution (200 µg/ml)	10 µl
Hexane	9.89 ml
<i>Total</i>	10.0 ml

- Aroclors 1016/1260 (1µg/ml) and Surrogates (0.2µg/ml) Working Solution: Prepared by measuring 50 µl of 1,000 µg/ml Aroclor 1016, 50 µl of 1,000 µg/ml Aroclor 1260, 10 µl of 200 µg/ml pesticides surrogate std spiking solution and bringing to 10 ml with hexane.
- Aroclors 1221/1254 (1µg/ml) and Surrogates (0.2µg/ml) Working Solution: Prepared by measuring 50 µl of 1,000 µg/ml Aroclor 1221, 50 µl of 1,000 µg/ml Aroclor 1254, 10 µl of 200 µg/ml pesticides surrogate std spiking solution and bringing to 10 ml with hexane.
- Aroclors 1232/1268 (1µg/ml) and Surrogates (0.2µg/ml) Working Solution: Prepared by measuring 50 µl of 1,000 µg/ml Aroclor 1232, 50 µl of 1,000 µg/ml Aroclor 1268 and bringing to 10 ml with hexane.

Table 3B. Individual Aroclor* and Surrogates Working Solution	
Stock Solution	Volume Added
Individual Aroclor* (1,000 µg/ml)	50 µl
Pesticides Surrogate Std Spiking Solution (200 µg/ml)	10 µl
Hexane	9.94 ml
<i>Total</i>	10.0 ml

*Aroclor: 1242 or 1248

- Individual Aroclor (1µg/ml) and Surrogates (0.2µg/ml) Working Solution: Prepared by measuring 50 µl of 1,000 µg/ml each individual Aroclor, 10 µl of 200 µg/ml pesticides surrogate std spiking solution and bringing to 10 ml with hexane.

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Table 4A. Aroclors 1016/1260 Calibration Standard Solutions					
Standard	Working Solution	Concentration (mg/ml)	Volume Added (ml)	Final Volume in Hexane (ml)	Final Concentration(mg/l)
Standard A	Aroclors 1016/1260	1	50	1	50
	Surrogates	0.2			10
Standard B	Aroclors 1016/1260	1	100	1	100
	Surrogates	0.2			20
Standard C	Aroclors 1016/1260	1	200	1	200
	Surrogates	0.2			40
Standard D	Aroclors 1016/1260	1	300	1	300
	Surrogates	0.2			60
Standard E	Aroclors 1016/1260	1	400	1	400
	Surrogates	0.2			80
Standard F	Aroclors 1016/1260	1	500	1	500
	Surrogates	0.2			100
Standard G	Aroclors 1016/1260	1	1,000	1	1,000
	Surrogates	0.2			200

- Standard A: Prepared by measuring 50 µl of Aroclors 1016/1260 Mixture and Surrogates Working Solution (Table 3A), and bringing to 1 ml with hexane.
- Standard B: Prepared by measuring 100 µl of Aroclors 1016/1260 Mixture and Surrogates Working Solution (Table 3A), and bringing to 1 ml with hexane.
- Standard C: Prepared by measuring 500 µl of Aroclors 1016/1260 Mixture and Surrogates Working Solution (Table 3A), and bringing to 1 ml with hexane.
- Standard D: Prepared by measuring 300 µl of Aroclors 1016/1260 Mixture and Surrogates Working Solution (Table 3A), and bringing to 1 ml with hexane.
- Standard E: Prepared by measuring 400 µl of Aroclors 1016/1260 Mixture and Surrogates Working Solution (Table 3A), and bringing to 1 ml with hexane.
- Standard F: Prepared by measuring 500 µl of Aroclors 1016/1260 Mixture and Surrogates Working Solution (Table 3A), and bringing to 1 ml with hexane.
- Standard G: Prepared by measuring 1000 µl of Aroclors 1016/1260 Mixture and Surrogates Working Solution (Table 3A), and bringing to 1 ml with hexane.

Note: Table 4A standard preparation is also used for Aroclors 1221/1254 and Aroclors 1232/1268 with the exception of the surrogate for Aroclors 1232/1268.

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Table 4B. Single-Point Calibration Standard (200 mg/l) for Individual Aroclor*	
Stock Solution	Volume Added
<i>Individual Aroclor*/Surrogate Working Solution (1mg/ml/0.2 mg/ml) (Table 3B)</i>	200 µl
<i>Hexane</i>	0.8ml
Total	1.0ml

* Aroclor: 1242 or 1248.

- Individual Aroclor Calibration Standard (200 µg/l) and Surrogates (40 µg/l) Solution: Prepared by measuring 200 µl of individual Aroclor and surrogates working solution, which contains 1 µg/ml of each corresponding Aroclor and 0.2 µg/ml of both surrogate compounds, and bringing to 1 ml with hexane.

Table 4C. Multi-point Calibration Standards for Individual Aroclor* (optional)					
Standard	Stock Solution	Concentration (mg/ml)	Volume Added (ml)	Final Volume in Hexane (ml)	Final Concentration(mg/l)
Standard A	Aroclor*	1	50	10	50
	Surrogates	0.2			10
Standard B	Aroclor*	1	100	10	100
	Surrogates	0.2			20
Standard C	Aroclor*	1	200	10	200
	Surrogates	0.2			40
Standard D	Aroclor*	1	300	10	300
	Surrogates	0.2			60
Standard E	Aroclor*	1	400	10	400
	Surrogates	0.2			80
Standard F	Aroclor*	1	500	10	500
	Surrogates	0.2			100
Standard G	Aroclor*	1	1,000	10	1,000
	Surrogates	0.2			200

*Aroclor: 1221/1254, 1232/1268, 1242 or 1248.

- Standard A: Prepared by measuring 50 µl of Individual Aroclor and Surrogates Working Solution (Table 3B), and bringing to 1 ml with hexane.
- Standard B: Prepared by measuring 100 µl of Individual Aroclor and Surrogates Working Solution (Table 3B), and bringing to 1 ml with hexane.
- Standard C: Prepared by measuring 200 µl of Individual Aroclor and Surrogates Working Solution (Table 3B), and bringing to 1 ml with hexane.

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- Standard D: Prepared by measuring 300 µl of Individual Aroclor and Surrogates Working Solution (Table 3B), and bringing to 1 ml with hexane.
- Standard E: Prepared by measuring 400 µl of Individual Aroclor and Surrogates Working Solution (Table 3B), and bringing to 1 ml with hexane.
- Standard F: Prepared by measuring 500 µl of Individual Aroclor and Surrogates Working Solution (Table 3B), and bringing to 1 ml with hexane.
- Standard G: Prepared by measuring 1,000 µl of Individual Aroclor and Surrogates Working Solution (Table 3B), and bringing to 1 ml with hexane.

Table 5A. Continuing Calibration Check Solutions for Aroclors 1016/1260					
Checks	Working Solution	Concentration (mg/ml)	Volume Added (ml)	Final Volume in Hexane (ml)	Final Concentration (mg/l)
Solution 1	Aroclors 1016/1260	1	200	1	200
	Surrogates	0.2			40
Solution 2	Aroclors 1016/1260	1	300	1	300
	Surrogates	0.2			60

- Solution 1: Prepared by measuring 200 µl of Aroclors 1016/1260 Mixture and Surrogates Working Solution (Table 3A), and bringing to 1 ml with hexane.
- Solution 2: Prepared by measuring 300 µl of Aroclors 1016/1260 Mixture and Surrogates Working Solution (Table 3A), and bringing to 1 ml with hexane.

Table 5B. Continuing Calibration Check Solutions for Individual Aroclor*					
Checks	Working Solution	Concentration (mg/ml)	Volume Added (ml)	Final Volume in Hexane (ml)	Final Concentration (mg/l)
Solution 1	Aroclor*	1	200	1	200
	Surrogates	0.2			40
Solution 2	Aroclor*	1	300	1	300
	Surrogates	0.2			60

* Aroclor: 1221/1254, 1232/1268, 1242 or 1248

- Solution 1: Prepared by measuring 200 µl of Individual Aroclor and Surrogates Working Solution (Table 3B), and bringing to 1 ml with hexane.
- Solution 2: Prepared by measuring 300 µl of Individual Aroclor and Surrogates Working Solution (Table 3B), and bringing to 1 ml with hexane.

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Table 6A. Second Source Calibration Check Standard for Aroclors 1016/1260 (1,000 mg/l)	
Stock Solution	Volume Added
<i>Aroclors 1016/1260 (2 mg/ml) and Surrogates (2.5 mg/ml) Working Solution</i>	100 µl
<i>Hexane</i>	900 µl
<i>Total</i>	1 ml

- Aroclors 1016/1260 (2 µg/ml) a Working Solution: Prepared by measuring 100 µl of 2 µg/ml Aroclors 1016/1260 mix solution (2nd source) and bringing to 10 ml with hexane.

Table 6B. Second Source Calibration Check Standard for Individual Aroclor* (1,000 mg/l)	
Stock Solution	Volume Added
<i>Individual Aroclor* (2 mg/ml) Working Solution</i>	100 µl
<i>Hexane</i>	900 µl
<i>Total</i>	1 ml

*Aroclor: 1221/1254, 1232/1268, 1242 or 1248.

- Individual Aroclor (2 µg/ml) Working Solution: Prepared by measuring 100 µl of 2 µg/ml each individual Aroclor stock solution (2nd source) and bringing to 10 ml with hexane.

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evaporate large volumes of solvent used for organic extractions to increase the concentration of the analyte in the solvent.

TURBOVAP CONCENTRATOR- A computerized sample concentration device that automatically reduces sample extracts to preset volumes operating unattended.

MATRIX - the predominant material of which the sample to be analyzed is composed. For the purpose of this SOP, a sample matrix is water, oil or soil/sediment. Matrix is not synonymous with phase (liquid or solid).

MATRIX SPIKE - aliquot of a matrix (water or soil) fortified (spiked) with known quantities of specific compounds and subjected to the entire analytical procedure in order to indicate the appropriateness of the method for the matrix by measuring recovery.

MATRIX SPIKE DUPLICATE - a second aliquot of the same matrix as the matrix spike (above) that is spiked in order to determine the precision of the method.

METHOD BLANK - an analytical control consisting of all reagents, internal standards, and surrogate standards that is carried throughout the entire analytical procedure. The method blank is used to define the level of laboratory, background, and reagent contamination.

PERCENT DIFFERENCE (%D) - As used in this SOW and elsewhere to compare two values, the percent difference indicates both the direction and the magnitude of the comparison, i.e., the percent difference may be either negative, positive, or zero. (In contrast, see relative percent difference.)

PERCENT MOISTURE - an approximation of the amount of water in a soil/sediment sample made by drying an aliquot of the sample at 105° C. The percent moisture determined in this manner also includes contributions from all compounds that may volatilize at or below 105° C, including water. Percent moisture may be determined from decanted samples and from samples that are not decanted.

REAGENT WATER - water in which an interferant is not observed at or above the minimum quantitation limit of the parameters of interest.

Soxhlet Extractor with Condenser Column –The device is used for extraction of organic constituents in solid samples.

WIPE – An inert fabric of known area used to swab the surface of a contaminated area for the purpose of removing the contamination from the surface for chemical analysis.

TURBOVAP CONCENTRATOR - A computerized sample concentration device that automatically reduces sample extracts to preset volumes operating unattended.

RADIPVAP CONCENTRATOR - A computerized sample concentration device that automatically reduces sample extracts to preset volumes operating unattended, similar to TurboVap but without a water bath.

LIQUID-LIQUID EXTRACTOR – A solvent extractor consisting of a Liquid-Liquid detector with ground glass joint to attach a condenser and round bottom flask.

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CHILL WATER RECLICUTALOR – A water chiller used to chill water and circulate chilled water to condenser on the liquid-liquid extractor.

5.0 Health and Safety

- 5.1 The analyst should follow normal safety procedures as outlined in the Accutest Laboratory Safety Manual which includes the use of safety glasses and lab coats. In addition, all acids are corrosive and should be handled with care. Flush spills with plenty of water. If acids contact any part of the body, flush with water and contact the supervisor.
- 5.2 The toxicity or carcinogenicity of each reagent used in this method has not been precisely determined; however, each chemical should be treated as a potential health hazard. Exposure to these reagents should be reduced to the lowest possible level. The laboratory maintains a current awareness file of OSHA regulations regarding the safe handling of the chemicals specified in this method. A reference file of data handling sheets is available to all personnel involved in these analyses.
- 5.3 Primary standards of toxic compounds must be prepared in a hood.

6.0 Interferences

- 6.1 Solvents, reagents, glassware, and other sample processing hardware may yield artifacts and/or interferences to sample analysis. Blanks must be analyzed to demonstrate that these materials are free from interferences under the conditions of the analysis.
- 6.2 Interferences co-extracted from the samples will vary considerably from source to source. If interferences prevent the analysis of an extracted sample, further cleanup of the sample extract may be employed if necessary. Refer to SW-846 Method 3600 for cleanup procedures.
- 6.3 Phthalate esters contaminate many types of products commonly found in the laboratory. Avoid plastics in particular because they contain phthalates, used as plasticizers, which can leach from these materials. Practice sound, consistent materials control to avoid phthalate contamination, which may occur at any time. Soap residue (e.g. sodium dodecyl sulfate), which results in a basic pH on glassware surfaces, may cause degradation of certain analytes. Specifically, Aldrin, Heptachlor, and most organophosphorus pesticides will degrade in this situation. This occurs in glassware that is difficult to rinse (e.g., 500-mL K-D flask). Carefully hand-rinse these items to avoid this problem.

7.0 Collection, Preservation and Holding Times

- 7.1 Collect samples in wide mouth glass jars.
- 7.2 Collect wipe samples in wide mouth glass jars.
- 7.3 Cool samples to $\leq 6^{\circ}\text{C}$ and store at $\leq 6^{\circ}\text{C}$ until extraction.

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- 7.4 Thirty (30) grams of solid samples are required for an extraction. Additional sample volume may be necessary for any samples used for matrix duplicates and matrix spikes.
- 7.5 Extract samples within 14 days of sampling and analyze the extract within 40 days of the extraction.
- 7.6 Store the base, neutral, & acid sample extracts and DRO extracts at -10°C in glass vials (protected from light) sealed with PTFE-lined septa. Store pesticide & PCB extracts at $\leq 6^{\circ}\text{C}$ in the same type vial.

8.0 Apparatus and Materials

- 8.1 Drying column – (glass funnel containing pre-washed filter paper and sodium sulfate)
- 8.2 TurboVap
- 8.3 TurboVap tubes
- 8.4 Kuderna-Danish Evaporator
 - 8.4.1 400 and 250ml Receiving Flasks
 - 8.4.2 Three-ball Snyder column
 - 8.4.3 Ten (10) ml graduated concentrator tube (pre-calibrated).
- 8.5 100 μL , 1 mL, 5 mL, and 10ml calibrated gastight syringes
- 8.6 1 mL, 5 mL, 10 mL, 100 mL, 1000 mL and 2000ml calibrated Class A volumetric
- 8.7 2-ml crimp vials with Teflon lined top and crimping and decapping tool.
- 8.8 Glass wool.
- 8.9 Teflon Boiling Chips or Glass Beads (solvent extracted).
- 8.10 Evaporating steam baths capable of temperatures from $55^{\circ}\text{C} - 90^{\circ}\text{C} \pm 5^{\circ}\text{C}$.
 - 8.10.1 Record the operating temperature daily with use.
- 8.11 Nitrogen blow-down apparatus with water bath, capable of maintaining a temperature of $35^{\circ}\text{C} \pm 3^{\circ}\text{C}$.
 - 8.11.1 Record the operating temperature daily with use.
- 8.12 Top loading balance, capable of weighing to 0.01 grams and certified weights.
- 8.13 Vortex touch mixer

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- 8.14 Round bottom glass flask - 500 mL.
- 8.15 16 ounce bottle with Teflon lined cap
- 8.16 Apparatus for grinding dry waste samples.
- 8.17 TurboVap Nitrogen Blowdown Concentrator.
- 8.18 TurboVap Concentrator Tubes- 300 mL.
- 8.19 RapidVap Nitrogen Blowdown Concentrator.
- 8.20 RapidVap Concentrator Tubes – 600 mL.
- 8.21 Boiling chips-solvent extracted 10/40 mesh.
- 8.22 Vials -2.0 mL, glass with Teflon lined screw caps.
- 8.23 Filter paper - Whatman 41 or equivalent.
- 8.24 Balance-top loading and analytical, capable of weighing to the nearest 0.01g and 0.0001g.
- 8.25 Spatula - Stainless steel or PTFE.
- 8.26 400 mL Beakers.
- 8.27 Paper Extraction Thimble – must be pre-cleaned prior to extraction
- 8.28 Glass Wool.
- 8.29 Heating mantle with rheostat controller.
- 8.30 Recirculating water chiller,
- 8.31 Glass funnel – 60° Pyrex or equivalent.
- 8.32 Soxhlet Extractor with condenser attached to recirculating water chiller

9.0 Reagents

- 9.1 Hexane – reagent grade for pesticide residue analysis.
- 9.2 Acetone – reagent grade for trace organic analysis.
- 9.3 Methylene Chloride– reagent grade for trace organic analysis.

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- 9.4 Methylene Chloride/Acetone. 1:1 - reagent grade for trace organic analysis – mix equal parts of each solvent.
- 9.5 Sodium sulfate - granular anhydrous, prepared by baking at 500°C for a minimum of 4 hours.
- 9.6 Nitrogen Gas – High Purity Grade.
- 9.7 Surrogate and Matrix Spiking Solutions. See SOP for target compound specifications.

<u>Method</u>	<u>Surrogate Conc.</u>	<u>Vol Surr. ml</u>	<u>Target CMPD Spike Conc.</u>	<u>Vol Spike ml</u>	<u>SOP</u>
SW 846-8081			250-2500 ug/ml	1.0	TGC006
SW 846-8082			200 ug/ml	1.0	TGC005
SW 846-8081/8082	100ug/ml	1.0			TGC006/005
SW 846-8270 BN/A	100/50 ug/ml	1.0	100 ug/ml	0.5	TMS001
SW 846-8015DRO	50 ug/ml	1.0	1000 ug/ml	1.0	TGC009

- 9.7.1 BNA Surrogate Solution – prepared in methanol at a concentration specified by the GC/MS analyst. Refer to SOP TMS001 for surrogate preparation. All surrogate solutions must be logged in the Spike and Surrogate Logbook.
- 9.7.2 BNA Spike Solution – prepared in methanol at a concentration specified by the GC/MS analyst. Refer to SOP TMS001 for spike preparation. All spike solutions must be logged in the Spike and Surrogate Logbook.
- 9.7.3 Pesticide/PCB Surrogate Solution – prepared in methanol at a concentration specified by the GC analyst. Refer to SOPs TGC005 and TGC006 for surrogate preparation. All surrogate solutions must be logged in the Spike and Surrogate Logbook.
- 9.7.4 Pesticide Spike Solution – prepared in methanol at a concentration specified by the GC analyst. Refer to SOP TGC006 for spike preparation. All spike solutions must be logged in the Spike and Surrogate Logbook.
- 9.7.5 PCB Spike Solution – prepared in methanol at a concentration specified by the GC analyst. Refer to SOP TGC005 for spike preparation. All spike solutions must be logged in the Spike and Surrogate Logbook.
- 9.7.6 DRO Spike Solution – prepared in methanol at a concentration specified by the GCMS analyst. Refer to SOP TGC009 for spike preparation. All spike solutions must be logged in the Spike and Surrogate Logbook.
- 9.7.7 DRO Surrogate Solution – prepared in methanol at a concentration specified by the GCMS analyst. Refer to SOP TGC009 for spike preparation. All spike solutions must be logged in the Spike and Surrogate Logbook.
- 9.8 Copper Powder Mesh: Aldrich powder, 150 mesh-or equivalent.

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- 9.8.1 Add copper to a 50-ml volumetric.
- 9.8.2 Add 5% Nitric Acid, slurry for 15-20 seconds.
- 9.8.3 Rinse 3-4 times with deionized water.
- 9.8.4 Rinse with Acetone.
- 9.8.5 Dry with Nitrogen.
- 9.8.6 The copper should be pink and shiny.
- 9.8.7 Store in an amber vial covered with hexane.

9.9 8272 Spiking Solutions

9.9.1 Surrogates

- 9.9.1.1 Surrogate Stock – available from commercial sources consisting of the following compounds each at 2000 ppm:

Acenaphthylene
Anthracene-d10
Benzo(a)pyrene-d12
Pyrene-d10

9.9.1.2 Working Surrogate Solution – 0.4 mg/L

- 9.9.1.2.1 Partial fill a 50 mL flask with 40 mL of acetone.
- 9.9.1.2.2 Add 0.4 mL of the stock surrogate solution from 9.9.1.1 to flask with a gas tight syringe.
- 9.9.1.2.3 Fill to mark with acetone. Stopper flask and invert three times to mix standard. Document standard preparation and logbook.

9.9.2 Spiking Standards

9.9.2.1 Stock Spiking Standards

- 9.9.2.1.1 PAH SIMS Mix – Supleco Quote#21282740, 1000 mg/L of each of the following compounds:

Acenaphthene
Acenaphthylene
Anthracene
Benzo(A)Anthracene
Benzo(A)Pyrene

Dibenz(A,H) Anthracene
Fluoranthene
Flourene
Indeno(1,2,3-CD)Pyrene
Naphthalene

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Benzo(B)Fluoranthene	Perylene
Benzo(E)Pyrene	Phenanthrene
Benzo(G, H, I)Perylene	Pyrene
Benzo(K) Fluoranthene	1-Methylnaphthalene
Chrysene	

- 9.9.2.1.2 2-Methylnaphthalene-d10 – 1000 ug/L, available commercially
- 9.9.2.1.3 1-Methylphenanthrene – 1000 ug/L, available commercially
- 9.9.2.1.4 2,3-Dimethylantracene – 1000 ug/L, available commercially
- 9.9.2.1.5 6-Methylchrysene – 1000 ug/L, available commercially
- 9.9.2.1.6 1-Methylpyrene – 1000 ug/L, available commercially
- 9.9.2.1.7 2-Methylfluoranthrene – neat, available commercially

- 9.9.2.1.7.1 2-Methylfluoranthrene Working STD - 5000 mg/L
- 9.9.2.1.7.1.1 Tare blank 10 mL volumetric flask vial.
- 9.9.2.1.7.1.2 Weigh out 0.05 g of 2-methylpyrene
- 9.9.2.1.7.1.3 Add acetone using a 10 mL gas tight syringe.

- 9.9.2.1.8 TRPH Standard (Ultra SNJ-200) – 200 ug/mL of each of the C8 to C40, Phytane and Pristane.

- 9.9.2.2 8272 Spiking Solution, 0.4 mg/L

- 9.9.2.2.1 Partial fill a 25 mL flask with 15 mL of acetone.
- 9.9.2.2.2 Add 10 uL of PAH SIMS Mix, from 8.5.2.1.1.
- 9.9.2.2.3 Add 10 uL of 2-Methylnaphthalene-d10, from 8.5.2.1.2.
- 9.9.2.2.4 Add 10 uL of 1-Methylphenanthrene, from 8.5.2.1.3.
- 9.9.2.2.5 Add 10 uL of 2,3-Dimethylantracene, from 8.5.2.1.4.
- 9.9.2.2.6 Add 10 uL of 6-Methylchrysene, from 8.5.2.1.5.
- 9.9.2.2.7 Add 10 uL of 1-Methylpyrene, from 8.5.2.1.6.
- 9.9.2.2.8 Add 2 uL of 2-Methylfluoranthrene Working STD, from 8.5.2.1.7.1.
- 9.9.2.2.9 Add 50 uL of TRPP, from 8.5.2.1.8.
- 9.9.2.2.10 Fill to mark with acetone. Stopper flask and invert three times to mix standard. Document standard preparation and logbook.

- 9.10 Ottawa Sand - baked at 425° C for 4 hours in a shallow tray. Document purification in the muffle furnace logbook. Ignited and purified Ottawa sand from the manufacture will also be acceptable.

10.0 Procedure

10.1 Sample Preparation

- 10.1.1 Collect samples from storage and allow to reach room temperature.
- 10.1.2 Decant and discard any water layer that may be present. Also discard any foreign objects such as twigs, leaves and rocks.

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10.1.3 For waste sample only the solid phase of the sample may be prepared by this method. The liquid phase must be treated separately.

10.1.4 Gummy, fibrous and oily materials not amenable to grinding should be cut or otherwise reduced in size to allow mixing and maximum exposure to the solvent. Addition of sodium sulfate to the sample may make the sample amenable to grinding.

10.2 Sample Extraction

10.2.1 Solids/Sulldges

10.2.1.1 Mix 30 g of the sample and 30 g of sodium sulfate and place sample in an extraction thimble. Method blank and blank spike are made using 30 g of clean Ottawa Sand and 30 gram of sodium sulfate. For cables and wires see section 10.2.2.

10.2.1.2 Add 1 mL of surrogate spiking standard to each sample, method blank and QC spike.

10.2.1.3 To each sample selected for matrix spiking add 1.0 mL of the matrix spiking solution to the sample.

10.2.1.4 For LCS sample add 1.0 mL of the matrix spiking standard to the sample.

10.2.1.5 Place a plug of glass wool over the sample and place the extraction thimble in the Soxhlet Extractor.

10.2.1.6 Add approximately 300 mL of solvent into the round bottom flask with two or three boiling chip. Attach the flask to the extractor and the extractor the condensing column and turn on the heating mantle and cooling water. The sample must be extracted for 16-24 hours at a rate of 4-6 cycles per hour.

10.2.1.7 When extraction is completed, turn off the mantle and allow sample to cool.

10.2.1.8 Transfer the extract to a clean bottle with a Teflon-lined cap thru a glass funnel with a small plug of glass wool and sodium sulfate and cap tightly. Store the extract at 4° C until ready for concentration if concentration is to be performed the next day. Concentration must occur that day or the next day following the extraction.

10.2.2 Cable and Wiring

10.2.2.1 Sample Handling - Samples must be handled in manner consistent with Accutest safety protocol.

10.2.2.1.1 Gloves must be changed with each sample to prevent the chance of cross-contaminations.

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10.2.2.1.2 Tools and hood surfaces must be cleaned with methylene chloride in between each sample to prevent possible cross-contamination of samples by rinsing with methylene chloride. Rinse equipment in such manner to collect rinseate in the waste container.

10.2.2.2 Sample Preparation

10.2.2.2.1 Ideally, the entire length of sample will be prepared. If the length of cable is extremely long, the analyst will subsample the sample with sections from the two ends and center of the wire/cable. Please bear in mind the ideally sample quantity is at least 30 grams of sample, if 30 grams is not possible a minimum of 5 grams may be used.

10.2.2.2.2 For electrical wiring with outer plastic insulation with single metal core or multiple twisted metal strands.

10.2.2.2.2.1 The outer insulation may be removed by cutting the wire length wise and separate the insulation from the wire by pulling the two apart.

10.2.2.2.2.2 Once separated, cut the plastic insulation into 1/2" strips with a clean knife or scissor. Collect sample in a clean wide mouth jar of the appropriate size.

10.2.2.2.2.3 Repeat step 10.2.2.2.2.2 for the metallic core using cleaned wire cutter.

10.2.2.2.3 For coaxial cable, the must separate all layers.

10.2.2.2.3.1 The outer insulation may be removed by cutting the wire lengthwise and separate the outer layer from the inner layers.

10.2.2.2.3.2 Next, cut the woven metallic shield directly under outer plastic layer by cutting the metallic layer with a knife and separate the metallic shield from the inner core.

10.2.2.2.3.3 Cut the inner plastic insulation along the length of the cable and pull the insulation away from the metal core.

10.2.2.2.3.4 Once separated, cut the plastic insulations, outer and inner into 1/2" strips with a clean knife or scissor and combine into one sample. Collect sample in a clean wide mouth jar of the appropriate size.

10.2.2.2.3.5 Repeat step 10.2.2.2.3.4 for the metallic core and woven metal shield using cleaned wire cutter.

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- 10.2.2.2.4 Ethernet/Telecom Cables - These cables are generally made up of a number of individually insulated copper wire twisted together to form a single strand that is insulated with outer shield of different plastic material for per usage and/or fire rating. The outer insulation will be combined with the insulation from the individual strand as one sample and the individual metallic wires after having their insulation removed will be combined into another sample.
- 10.2.2.2.4.1 The outer insulation may be removed by cutting the wire lengthwise and separate from the inner bundle from the outer layer by pulling the two apart.
- 10.2.2.2.4.2 To strip the insulation of the individual stands, first untwist the bundle and separate the strands.
- 10.2.2.2.4.3 With a razor or hobby knife, strip off approximately one inch of insulation of the end of each wire. Separate the wire from the insulation and pull apart.
- 10.2.2.2.4.4 Once separated, cut the plastic insulations, outer and inner into ½" strips with a clean knife or scissor and combine into one sample. Collect sample in clean a wide mouth jar of the appropriate size.
- 10.2.2.2.4.5 Repeat step 10.2.2.2.4.4 for the individual stands using cleaned wire cutter.
- 10.2.2.2.5 Thoroughly mix the samples in the jar before transferring to extraction thimbles. As noted 30 grams of sample is the ideal weight to be extracted. However the sample amount may be changed to due to amount of sample submitted for testing. Samples are now ready for extraction using SOP Step 10.2.1. In 10.2.1.6, rinse wide mouth jar with small portion of methylene chloride and add to round bottom flask.

10.3 TurboVap Concentration

- 10.3.1 Place the drying column on top of a TurboVap concentrator tube to collect the "dried" extract. Label all apparatus with the correct sample identification. Pour the solvent from the storage bottle or 500mL Erlenmeyer flask through the sodium sulfate drying column into the TurboVap tube. The entire sample extract volume may fit in one tube, fill tube until approximately ¾ full. **Important:** Do not allow the sodium sulfate to become dry between solvent extracts
- 10.3.2 Label the TurboVap tubes and place them in the metal support rack. Transfer each extract to the appropriately labeled tube.

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- 10.3.3 Set the water bath temperature for the TurboVap to 42° C, and the pressure at 16 to 18 PSI. Place the tube in the TurboVap. **NOTE:** If the bath is too hot, the more volatile compounds may be lost during this step. Concentrate the extract to approximately 50ml.
- 10.3.4 Remove the TurboVap tube and transfer the remaining extract from the Erlenmeyer flask to the appropriate tube. Rinse each Erlenmeyer flask with methylene chloride and transfer it to the appropriate tube.
- 10.3.5 Return the tube to the TurboVap and concentrate the extract to 0.7ml. **NOTE:** for pesticides and PCBs concentrate to approximately 5mL and proceed to Section 10.7.
- 10.3.6 Remove the TurboVap tube and place it in the metal support rack to allow it to cool.
- 10.3.7 If the extract is cloudy or contains water droplets, run the extract through a micro column of glass wool and sodium sulfate.
- 10.3.8 Transfer the extract to a 1.0ml volumetric flask. Rinse the TurboVap tube with a few drops of methylene chloride and transfer it to the volumetric flask. Adjust the final volume to 1.0ml. **NOTE:** If the extract will not concentrate to 1.0ml, choose the next appropriate volume and bring to a final volume of 10ml. Be sure to record the final volume on the prep sheet. For methods 8081 8082, transfer the extract to a 25ml screw cap vial, and adjust the final volume to 10ml. Record the final volume. **NOTE:** A 10ml template is prepared daily for the correct final volume by filling a 10ml volumetric flask with hexane and transferring it to a 25ml screw cap vial. The correct final volume can be accurately achieved by directly transferring the extract to a 25ml screw cap vial and carefully matching the volume level to the template vial. To avoid error the template must be prepared daily to avert any variances due to evaporation of the solvent.
- 10.3.9 Transfer the extract to an appropriately labeled 2.0ml screw cap vial. Store the extracts in the "extract refrigerator" until they are needed for analysis.
- 10.4 Solvent exchange –TurboVap
- 10.4.1 If a solvent exchange is required (methods 608, 8081, 8082 require exchange to hexane).
- 10.4.2 Set the water bath temperature for the TurboVap to 42° C. Place the tube in the TurboVap. Concentrate the extract to less than 5ml.
- 10.4.3 Add approximately 50ml of hexane to the each of the TurboVap tubes. Increase the TurboVap water bath temperature to 55° C and concentrate extract to less than 5ml. Remove the TurboVap tube and place it in the metal support rack to allow it to cool.
- 10.4.4 If the extract is cloudy or contains water droplets, run the extract through a micro column of glass wool and sodium sulfate.
- 10.4.5 Transfer the extract to a 25ml screw cap vial, and adjust the final volume to 10ml. Record the final volume. **NOTE:** A 10ml template is prepared daily for the correct final volume by filling a 10ml volumetric flask with hexane and transferring it to a 25ml screw cap vial. The correct final volume can

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be accurately achieved by directly transferring the extract to a 25ml screw cap vial and carefully matching the volume level to the template vial. To avoid error the template must be prepared daily to avert any variances due to evaporation of the solvent.

- 10.4.6 If the extract is to be analyzed for pesticides, transfer some of the extract to an appropriately labeled 2.0 ml screw cap vial. This is kept as a backup.
- 10.4.7 Proceed to acid cleaning procedure and for sulfur cleaning procedure for PCBs. The pesticide fraction undergoes only the sulfur cleanup procedure.

10.5 RapidVap Nitrogen Concentrator

- 10.8.1 Select the temperature of approximately 40 degrees C, and the nitrogen pressure at 10-11psi.
- 10.8.2 Set RapidVap speed base on sample volume using the following table:

Tube Size	Sample Volume	Vortex Speed
600 mL	50 mL	90%
	100 mL	90%
	200 mL	76%
	300 mL	58%
	400 mL	40%
	450 mL	36%

As the volume decrease in the concentrator tube, the analyst must increase the speed of the vortex.

- 10.8.3 Label tube with sample I.D. Transfer the extract into concentrator tube and rinse the container with a small volume of Methylene chloride and add to concentrator. Concentrate the extract to a volume of just less than 1 mL.
- 10.8.4 Concentrate the extract to less than 1 mL (CAUTION: when the volume of solvent is reduced below 1 mL, semivolatile analytes may be lost, proceed carefully). Transfer the extract to a 1.0ml volumetric flask. Rinse the RapidVap tube with a few drops of methylene chloride and transfer it to the volumetric flask. Adjust the final volume to 1.0mL. **NOTE:** If the extract will not concentrate to 1.0ml, choose the next appropriate volume and bring to a final volume of 10ml. Be sure to record the final volume on the prep sheet. For methods 8081 8082, transfer the extract to a 25ml screw cap vial, and adjust the final volume to 10ml. Record the final volume. **NOTE:** A 10ml template is prepared daily for the correct final volume by filling a 10ml volumetric flask with hexane and transferring it to a 25ml screw cap vial. The correct final volume can be accurately achieved by directly transferring the extract to a 25ml screw cap vial and carefully matching the volume level to the template vial. To avoid error the template must be prepared daily to avert any variances due to evaporation of the solvent.
- 10.8.5 Transfer the sample to the properly named storage box. The logbook pages must contain all pertinent information for the samples including any anomalies that were encountered during the

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extraction process. Submit copy of extraction records with extracts to the appropriate Section Supervisor or designee.

10.6 RapidVap Solvent Exchange

- 10.6.1 If a solvent exchange is required (methods 608, 8081, 8082 require exchange to hexane).
- 10.6.2 Concentrate the extract to less than 5ml. Stop the RapidVap.
- 10.6.3 Add approximately 50ml of hexane to the each of the tubes. Set RapidVap speed to approximately 90% and start concentrator.
- 10.6.4 If the extract is cloudy or contains water droplets, run the extract through a micro column of glass wool and sodium sulfate.
- 10.6.5 Transfer the extract to a 25ml screw cap vial, and adjust the final volume to 10ml. Record the final volume. **NOTE:** A 10ml template is prepared daily for the correct final volume by filling a 10ml volumetric flask with hexane and transferring it to a 25ml screw cap vial. The correct final volume can be accurately achieved by directly transferring the extract to a 25ml screw cap vial and carefully matching the volume level to the template vial. To avoid error the template must be prepared daily to avert any variances due to evaporation of the solvent.
- 10.6.6 If the extract is to be analyzed for pesticides, transfer some of the extract to an appropriately labeled 2.0 ml screw cap vial. This is kept as a backup.
- 10.6.7 Proceed to acid cleaning procedure and for sulfur cleaning procedure for PCBs. The pesticide fraction undergoes only the sulfur cleanup procedure.

10.7 K-D Technique

- 10.7.1 Assemble a Kuderna-Danish (K-D) concentrator by attaching a 10-mL concentrator tube to a 500-mL evaporation flask.
- 10.10.2 Attach the solvent vapor recovery glassware (condenser) to the Snyder column of the K-D apparatus.
- 10.10.3 Dry the extract by passing it through a drying column containing anhydrous sodium sulfate. Collect the dried extract in a K-D concentrator. Rinse the Erlenmeyer flask or container, which contained the solvent extract, with 20 - 30 mL of methylene chloride and add it to the column to complete the quantitative transfer.
- 10.10.4 Add one or two clean boiling chips to the flask and attach a three-ball Snyder column. Prewet the Snyder column by adding about 1 mL of methylene chloride to the top of the column. Place the K-D apparatus on a hot water bath (15 – 20° C above the boiling point of the solvent) so that the concentrator tube is partially immersed in the hot water and the entire lower rounded surface of the flask is bathed with hot vapor. Adjust the vertical position of the apparatus and the water temperature, as required, to complete the concentration in 10 - 20 minutes. At the

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proper rate of distillation the balls of the column will actively chatter, but the chambers will not flood. When the apparent volume of liquid reaches 1 mL, remove the K-D apparatus from the water bath and allow it to drain and cool for at least 10 minutes.

10.8 Solvent Exchange – K D

- 10.8.1 If a solvent exchange is required (methods 608, 8081, 8082 require exchange to hexane), momentarily remove the Snyder column, add 50 ml of the exchange solvent, a new boiling chip, and reattach the Snyder column. Concentrate the extract, as described in Sec. 10.5.17, raising the temperature of the water ($85 \pm 5^{\circ}\text{C}$ for hexane) bath to maintain proper distillation.
- 10.8.2 Remove the Snyder column and rinse the flask and its lower joints into the concentrator tube with 1 - 2 ml of hexane. If sulfur crystals are a problem, proceed to SOP TOP014 for cleanup. Concentrate the extract to approximately 5ml.
- 10.8.3 Remove the K-D apparatus from the bath and allow the solvent condensed in the Snyder column to drip back down into the concentrator tube. Allow the solvent to cool for approximately 10 minutes, then remove the Snyder column and K-D flask while rinsing each connector joint with 1 ml of hexane
- 10.8.4 Transfer the extract to a properly labeled 25ml screw cap vial and adjust to a final volume of 10ml. using a Pasteur pipette. Rinse the receiving flask with hexane. Label the vial with sample number and batch number. Protect the extracts from light and store them in the extract freezer at -10°C .
- 10.8.5 Fill the empty sample jar with tap water to the mark on the jar from step 12.1. Pour the contents of the jar into a graduated cylinder and measure the volume. This is the sample volume that is recorded on the extraction log.

12.0 Calculations

- 12.1 Not applicable.

13.0 QC Requirements

- 13.1 A method blank and blank spike is required on each day of extraction or every 20 samples, whichever is more frequent.
- 13.2 A matrix spike/ matrix spike duplicate is required per 20 samples.
- 13.3 A separate BSP and MS/MSD set are needed if the sample requires PCBs, Toxaphene and/or chlordane. Therefore, if a sample is to be extracted for pesticides and PCBs, 2 sets of MS/MSDs and BSP are needed.

14.0 Documentation

- 14.1 All the information required by the extraction logbooks must be completed.

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14.2 All standards preparation must be documented in the standards preparation logbook.

14.3 Equipment maintenance logs must be maintained.

15.0 Data Review And Reporting

15.1 The analyst or supervisor reviews all extraction log information for completeness and accuracy prior to the release of sample extracts for analysis.

15.2 The extraction analyst updates the sample status in the LIMS upon completion of the extraction.

16.0 Pollution Prevention & Waste Management

16.1 Users of this method must perform all procedural steps in a manner that controls the creation and/or escape of wastes or hazardous materials to the environment. The amounts of standards, reagents, and solvents must be limited to the amounts specified in this SOP. All safety practices designed to limit the escape of vapors, liquids or solids to the environment must be followed. All method users must be familiar with the waste management practices described in section 16.2.

16.2 Waste Management. Individuals performing this method must follow established waste management procedures as described in the waste management SOP, TSM003. This document describes the proper disposal of all waste materials generated during the testing of samples as follows:

16.2.1 Non hazardous aqueous wastes.

16.2.2 Hazardous aqueous wastes

16.2.3 Chlorinated organic solvents

16.2.4 Non-chlorinated organic solvents

16.2.5 Hazardous solid wastes

16.2.6 Non-hazardous solid wastes

15.0 ADDITIONAL REFERENCE

15.1 SW-846 Method 8270C, SEMIVOLATILE ORGANIC COMPOUNDS BY GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS) Revisions 3, December 1996.

15.2 SW-846 Method 8081A, ORGANOCHLORINE PESTICIDES BY GAS CHROMATOGRAPHY, Revision 1, December 1996.

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- 15.3 SW-846 Method 8082, POLYCHLORINATED BIPHENYLS (PCBs) BY GAS CHROMATOGRAPHY, Revision 0, December 1996.
- 15.4 SW-846 Method 8015C, NONHALOGENATED ORGANICS BY GAS CHROMATOGRAPHY, Revision 3, February 2007.

Extraction Conditions of Soil Samples

Method	Exchange Solvent	Spike Volumes	Initial Sample Weight	Final Volume
8272	None		30.0 g	1.0 mL
Surrogate		1.0 mL		
Matrix spike		1.0 mL		
8270	None		30.0 g	1.0 mL
Surrogate		1.0 mL		
Matrix spike		1.0 mL		
8081	None		30.0 g	10.0 mL
Surrogate		1.0 mL		
Matrix spike		1.0 mL		
8082	None		30.0 g	10.0 mL
Surrogate		1.0 mL		
Matrix spike		1.0 mL		
8015 DRO	None		30.0 g	1.0 mL
Surrogate		1.0 mL		
Matrix spike		1.0 mL		

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APPENDIX D

SITE SPECIFIC HEALTH & SAFETY PLAN



HEALTH AND SAFETY PLAN

Prepared By:
ATC Associates Inc.
920 Germantown Pike, Suite 200
Plymouth Meeting, Pennsylvania 19462

Prepared For:
S.S. United States
Pier 82
Philadelphia, PA 19148
ATC Project No. 68.40497.0001

THINK
SAFETYFirst!

This Health and Safety Plan (HASP) has been written for the use of ATC and its employees. It may also be used as a guidance document by properly trained and experienced ATC subcontractors. However, ATC does not guarantee the health or safety of any person entering this Site.

Due to the potential hazardous nature of this Site and the activity occurring thereon, it is not possible to discover, evaluate, and provide protection for all possible hazards which may be encountered. Strict adherence to the health and safety guidelines set forth herein will reduce, but not eliminate, the potential for injury at this Site. It is imperative that every individual on this Site be aware and takes precautions to protect his or her own health and safety. The health and safety guidelines in this HASP were prepared specifically for this Site and should not be used on any other Site without prior research by trained health and safety specialists.

ATC claims no responsibility for use of this HASP by others. The HASP is written for the specific Site conditions, purposes, dates, and personnel specified and must be amended if these conditions change.

**** EMERGENCY PHONE NUMBERS ****

PARAMEDICS: (Name): Philadelphia Fire Department
(Phone): 911 or 215.686.1300 (non-emergency)

FIRE DEPT: (Name): Philadelphia Fire Department
(Phone): 911 or 215.686.1300 (non-emergency)

LOCAL POLICE: (Name): Philadelphia Police Department
(Phone): 911 or 215.686.3060 (non-emergency)

HOSPITAL: (Name): Thomas Jefferson University Hospital
(Address): 111 So 11th Street
Philadelphia PA
(Phone): 215.955.6000
(Travel Time): 10 minutes
(Directions): See attached

UTILITY MARK OUT (Name): PA One Call
(Phone): 811 or 1-800-242-1776 (from out of state)

EMERGENCY ASSEMBLY LOCATION: Pier 82 Entrance Guard Shack

CHEMTREC.....(800) 424-9300

NATIONAL RESPONSE CENTER..... (800) 424-8802

POISON CONTROL CENTER.....(800) 222-1222

DOT HOTLINE.....(202) 366-4488
Materials Transportation Bureau

CENTERS FOR DISEASE CONTROL AND PREVENTION(404) 633-5313
(Emergency Only)

PADEP HOTLINE(484) 250-5900

SOLID WASTE AND EMERGENCY RESPONSE.....(202) 260-2180
Office of Emergency and Remedial Response

TSCA ASSISTANCE INFORMATION SERVICES HOTLINE(202) 554-1404

COMP-CARE (24 hour First-Aid).....(800) 756-1130

BRANCH SAFETY OFFICER Office (610) 313-3100 x495
.....Cell (610) 220-3127

REGIONAL CORPORATE SAFETY OFFICER Office (610) 313-3100 x415
.....Cell (610) 969-8200

ATC DIRECTOR OF HEALTH AND SAFETY(317) 579-4051

ALL ONE HEALTH RESOURCES (ATC MEDICAL DIRECTOR).....(781) 935-8581

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1.0 General Information (1910.120 (c)(4))

This HASP will be kept on Site during field activities and will be reviewed as necessary. The HASP will be amended or revised as project activities or conditions change or when supplemental information becomes available. The HASP adopts, by reference, ATC's Policies (SOPs) in the ATC Employee Health and Safety Policy Manual, as appropriate. The Site Safety Officer (SSO) is to be familiar with the SOPs contained in the ATC Employee Health and Safety Policy Manual, and the contents of this plan. ATC's personnel and subcontractors must sign the ATC HASP Employee Sign-Off Form included in Section 6.17 after reading/reviewing this HASP.

2.0 Project Information and Description (1910.120 c)(4))

ATC Project No.: 68.40497.0001

Client: SS United States Conservancy

Project/Site Name: SS United States PCB Sampling

Site Address: Pier 82, Philadelphia, PA

ATC Sr. Project Manager: Christopher Candela

ATC Site Safety Officer: Christopher Candela

ATC Office: 920 Germantown Pike, Suite 200
Plymouth Meeting, PA 19462
610.313.3100

Client Project Manager: Dan McSweeney

Date HASP Prepared: November 29, 2010

Date(s) of Site Work: May through December 2011

Site Access: Site personnel are to access the site via the Pier 82 guard house/gate along Columbus Boulevard.

Site Topography: Not Applicable

Prevailing Weather: Average summer temperatures in Philadelphia range from approximately 62° F to 82° F. Average winter temperatures range from approximately 12° F to 32° F. The average annual precipitation is 45.5 inches. Wind chill factors at the site can be very cold in the winter.

Visitors to the Site: All visitors to the Site must be instructed about the hazards of the activities that ATC or its subcontractors are performing.

Subcontractor Activities: All subcontractors used at the Site have been Pre-Approved in the ATC Subcontractor Prequalification System.

3.0 Site Description (1910.120(c)(4))

The SS United States consists of the following twelve (12) decks, which are described below from bow (front of ship) to stern (rear of ship):

Navigating Bridge Deck

The Navigating Bridge Deck contained such areas as the wheel house, chart room, damage control room, radar/transmission room, elevator penthouses, fan rooms, tourist class sheltered deck, supply plenums, emergency generator room, and the tourist open deck.

Sports Deck

The Sports Deck contained such areas as the master's quarters, the executive officer's quarters, the master reception room, officers' quarters, officers' lounge, radio room, radio office, dog house and run, first class deck, fan room, engineers' and officers' mess, pantries, first class children's play room, battery room, electrical room and the first class game deck.

Sun Deck

The Sun Deck contained such areas as the penthouse, first class lodgings, first class ball room, pantries, junior engineers' quarters, motion picture booth, and crew quarters and the working deck.

Promenade Deck

The Promenade Deck contained such areas as the crew's open promenade, fan rooms, winch control room, open promenade, tourist lounge, tourist class theater, observation lounge, first class main entrance, first class ballroom, first class cocktail lounge, first class restaurant and associated pantry, first class smoking room and tobacco shop, shopping center, bar, first class and cabin class theater, electrical workshop, emergency generator, aft fan rooms and filter cleaning room, radiator rooms, raised promenade, and the aft steering station.

Upper Deck

The Upper Deck contained such areas as anchor handling area, crew quarters (seaman, etc), tourist class rooms, tourist class children play room, tourist class beauty and barber shops, first class rooms, telephone operator rooms, first class pantries, cabin class rooms, novelty shop, cabin class lounge, cabin class covered deck, and the cabin class open promenade deck.

Main Deck

The Main Deck contained such areas as the upholstery and carpenters shops, windlass motor room, crew quarters (boson mates, carpenter mates, etc), fan rooms, electric station, tourist class purser offices, tourist smoking room, tourist class rooms, first class purser offices, first class rooms, first class dining saloon, battery room, telephone room, first class pantries, more first class rooms, beautician rooms, cabin class smoking room,

more fan rooms, deck and engine recreation rooms, and the crews covered promenade.

“A” Deck

The “A” Deck contained such areas as the forward stores, crew quarters (yeomen and stewards, etc), tourist class rooms, tourist dining saloon, tourist class galley, first class dining saloon, first class galley, cabin class dining saloon, cabin class rooms, crew quarters (cooks, etc) and the capstan room.

“B” Deck

The “B” Deck contained such areas as the forward stores, crew quarters (bell captain, bell boys, etc), sick bay, house keeping, tourist class rooms, top of the forward boiler room, top of the forward engine room, crew messes, working spaces, print shop, electrical station, top of the after boiler room, fan room, top of the after engine room, more crew quarters, gymnasium, cabin class rooms, and more crew quarters.

“C” Deck

The “C” Deck contained such areas as the forward stores, chain locker, night crew quarters, tourist class rooms, more crew quarters, middle of the forward boiler room, middle of the forward engine room, port and starboard fuel oil tanks, crew quarters (firemen, etc), refrigerated storage, more crew quarters (plumbers, etc.), middle of the after boiler room, middle of the after engine room, port and starboard fuel oil tanks, after auxiliary machine space, swimming pool, baggage room, mail room, utility rooms, and the steerage gear room.

“D” Deck

The “D” Deck contained such areas as crew quarters, tourist class rooms, forward fuel oil settling tanks, middle of the forward boiler room, middle of the forward engine room, port and starboard fuel oil tanks, forward auxiliary machinery space, bulk stores, laundry services, after fuel oil settling tanks, middle of the after boiler room, middle of the after engine room, port and starboard fuel oil tanks, after auxiliary machinery space, after emergency pump room, shaft alley, baggage room, and the mail room.

“E” Deck

The “E” Deck was referred to as a “tween” deck and was not a full deck. The deck contained such areas as cargo space, stores and baggage space, potable water tanks, slop oil tank, and forward fuel oil settling tanks.

Inner Bottom Deck

The Inner Bottom Deck or the Hold contained such structures as the ballast tanks, fuel oil tanks, bottom of the forward boiler room, bottom of the forward engine room, forward auxiliary machinery space, storage (fruits, vegetables, beer, etc), clean linen storage, bottom of the after boiler room, bottom of the after engine room, after auxiliary machinery space, shaft tunnels, baggage room, mail room and other ballast tanks.

4.0 Description of work to be performed (1910.120(b)(3))

Descriptions of the specific tasks to be performed are in the Site Monitoring Plan. The following provides a summary of the key project components:

- Sampling of non-liquids for PCBs
- Sampling of paint for PCBs
- Sampling of liquids for PCBs
- Collection of wipe samples for PCBs.

5.0 Project Organization and Responsibilities (1910.120(b)(2))

All personnel and visitors who may enter work areas on this Site must comply with the requirements of this HASP. All Site personnel have the authority to “Stop Work” if unsafe conditions are present. The following presents the project team:

Team Member

C. Candela

A. Lofink

Various ATC Personnel

Responsibility

Sr. Project Manager / Site Health & Safety Officer

Project Manager

Sampling Staff

6.0 Tasks to be performed under this HASP (1910.120(b)(3))

Descriptions of the specific tasks to be performed are in the Sampling Plan. A Job Safety Analysis (JSA) has been performed for each task and a summary of the JSAs is included below while project-specific hazard controls are provided in the next section. Tasks other than those listed below require an approved amendment or revision to this HASP before tasks begin.

Hazwoper-Regulated Tasks

Under specific circumstances, the training and medical monitoring requirements of federal or state Hazwoper regulations are to be implemented in accordance with this HASP and following guidelines of 29CFR1910.120 for the following tasks:

- Collection of samples
- Equipment Decon

Non-Hazwoper-Regulated Tasks

Under specific circumstances, the training and medical monitoring requirements of federal or state Hazwoper regulations are not applicable. It must be demonstrated that the tasks can be performed without the possibility of exposure in order to use non-Hazwoper-trained personnel. The following tasks are considered non-hazardous:

- None

Environmental-Regulated Tasks and Conditions

Project tasks and site conditions that can impact the environment and are otherwise subject to environmental regulation are included in the following sections. These items are also known as the environmental aspects of the project (activities that can interact with the environment). Environmental impacts relating to each task or condition are also presented and are used to evaluate the project's significant impacts and control measures specified in Hazard Controls and Safe Work Practices section of this HASP. All personnel shall: (1) implement control measures described in Hazard Control Section; (2) obtain appropriate environmental training (e.g., Waste Management or Dangerous Goods Shipping) and (3) seek assistance from the Branch Safety Officer (BSO) for all environmental questions or issues.

Permit Required Tasks

The following tasks require a permit:

Task

Confined Space Entry

Permit Issued By

Site Safety Officer

Job Safety Analysis

The following table summarizes the Job Safety Analyses performed for this project.

		Potential Hazards																								
Task		Biological Hazards	Buried Utilities	Cold Stress	Confined Space Entry	Electrical	Excavations & Trenching	Exposure to Chemicals	Fall Protection	Gas Cylinders	Hand and Power Tools	Heat Stress	Heavy Equipment Exposure	Lifting, Manual	Lifting, Mechanical	Lockout-Tagout	Motor Vehicle Operation	Noise	Overhead Utilities	Respiratory Protection	Rigging	Slips, Trips, and Falls	Stairways and Ladders	Traffic Exposure	Welding and Cutting	(Reserved)
Sample Collection & Decon Activities		X		X	X	X		X	X		X	X		X		X	X	X		X		X	X			

Environmental Impact Analysis

	Environmental Impacts						
Task	Air Pollution	Land Pollution	Land Disposal	Noise Pollution	Water Pollution	Resource Depletion	Human Hazard
Sample Collection & Decon Activities	X	X	X	X	X		X

7.0 *Hazard Controls and Safe Work Practices*

This section provides safe work practices and control measures used to reduce or eliminate potential hazards. These practices and controls are to be implemented by the party in control of either the site or the particular hazard. ATC employees and subcontractors must remain aware of the hazards affecting them regardless of who is responsible for controlling the hazards. ATC employees and subcontractors who do not understand any of these provisions should contact the Project Health and Safety Officer for clarification. In addition to the hazard controls specified in this section, the following are required for ATC projects.

HASPs: ATC requires HASPs for all field projects and subcontractors are required to submit a HASP for their activities as well. The HASP provides a risk analysis of each task and identifies the potential hazards and control measures (including personal protective equipment and air monitoring requirements) for each task.

Job Safety Hazard Analysis (JSAs): JSAs are required by ATC for all tasks unless the Branch Safety Officer specifically determines it is unnecessary. JSAs provide a step-by-step analysis of the activity being performed and identify the equipment and control measures necessary to conduct the work safely. JSAs must be reviewed by the work team immediately prior to conducting the work. The JSAs can be a source of information for the daily safety meeting. Copies of JSAs are provided in **Attachment 1**.

Safety Meetings: ATC requires that the Project Health and Safety Officer conduct Daily Tailgate Safety meetings to discuss with the field team the task to be performed that day and the potential hazards and mitigation measure. In addition, the safety meeting can be used to review a JSA with the team. Tailgate Safety Meeting Forms used to document these meetings are included in **Attachment 2**.

Interventions: ATC's Corporate Health and Safety policy requires all ATC employees to intervene whenever we see someone exhibiting an unsafe behavior or working in unsafe conditions. When such a situation is observed, an intervention is performed by talking to the person about how the task could be done more safely.

8.0 Project-Specific Hazards and Controls

Heat Stress? ☒ Yes ☐ No If yes, please specify precautions to be taken:

Work is anticipated to be performed during the Summer months so Heat Stress is expected to represent a significant hazard. See ATC health and safety policy and procedure for Industrial Hygiene - Policy 23.

Cold Stress? ☒ Yes ☐ No If yes, please specify precautions to be taken:

Work is anticipated during Winter months, so Cold Stress may represent a potential Hazard. See ATC health and safety policy and procedure for Industrial Hygiene – Policy 23.

Excessive Noise? ☒ Yes ☐ No If yes, please specify precautions to be taken:

Elevated noise levels due to operation of generators as well as power tools represent a potential hazard. See ATC health and safety policy and procedure for Hearing Conservation – Policy 34.

Confined Entry? **Space** ☒ Yes ☐ No If yes, attach copy of Confined Space Entry Permit.

Not anticipated, but important for team members to be aware of their surroundings - Policy 10.

Excavations 4' or greater in depth? ☐ Yes ☒ No If yes, specify precautions to be taken:

Not Expected. See ATC health and safety policy and procedure for Fall Protection – Policy 17, Equipment Usage – Policy 15 and Excavation and Trenching – Policy 16.

Welding, Cutting & Brazing? ☐ Yes ☒ No If yes, specify precautions to be taken:

Not Expected. See ATC health and safety policy and procedure regarding Welding and Cutting – Policy 31.

Heavy Equipment ☐ Yes ☒ No If yes, specify precautions to be taken:

Operation? ☐ ☐

Not Expected. See ATC health and safety policy and procedure for Equipment Usage – Policy 15.

Slip, Trip or Fall Hazards? ☒ Yes ☐ No If yes, specify precautions to be taken:

Slip, Trip or Fall Hazards are general hazards that apply to all sampling activities. Use caution to avoid deck openings, cut mounts and missing rails. Maintain good housekeeping. See ATC health and safety policy and procedure for Fall Protection – Policy 17 and Housekeeping – Policy 22.

Heavy Lifting? ☒ Yes ☐ No If yes, specify precautions to be taken:

Heavy Lifting may be required periodically during all of the remedial tasks. Use two (2) people to lift all heavy objects such as objects greater than 50 pounds or objects that cannot be safely lifted by a single person. Lifting performed with weight over legs using legs not back to lift – Policy 23.

Electric Hazards? ☒ Yes ☐ No If yes, specify precautions to be taken:

Correctly operate portable generators. Be sure GFCI outlets are operational on generators. Inspect electrical cords for frays and breaks. SSUSC must provide written documentation that the vessel does not receive shore to ship electrical service prior to the start of sampling. See ATC health and safety policy and procedure for Electrical Hazards – Policy 12.

Traffic Hazards ☒ Yes ☐ No If yes, specify precautions to be taken:

Observe traffic patterns for off-site truck and equipment traffic. Look for trucks prior to crossing truck access routes. See ATC health and safety policy and procedure for work within Vehicle Traffic Areas – Policy 36.

Biological Hazards ☒ Yes ☐ No If yes, specify precautions to be taken:

The ship contains a large spider population. See ATC health and safety policy and procedure for Industrial Hygiene – Policy 23 and Bloodborne Pathogens – Policy 9.

Exposure to Chemicals (HazCom) ☒ Yes ☐ No If yes, specify precautions to be taken:

Potential Chemical Hazards at the site include possible exposure to PCBs. See ATC health and safety policy and procedure for Hazard Communication – Policy 21, HAZWOPPER – Policy 35 and PPE – Policy 25.

Fall Protection☒

Yes

☐

No

If yes, specify precautions to be taken:

This applies to all ATC offices, client job sites, etc., where field activities involve exposure to heights greater than or equal to six (6) feet and/or falling objects exist. In general industry (e.g. offices, shops, warehouses, etc.) exposure to heights greater than or equal to four (4) feet shall be in place of all references to the construction six (6) foot reference.

See ATC health and safety policy and procedure for Fall Protection – Policy 17.

Gas Cylinders☐

Yes

☒

No

If yes, specify precautions to be taken:

Not Expected. See ATC health and safety policy and procedure for Tools and Welding and Cutting – Policy 31.

Tools☒

Yes

☐

No

If yes, specify precautions to be taken:

Follow procedures for the safe use, care, and inspection of tools that are owned and rented by ATC Associates, and employee-provided tools.

See ATC health and safety policy and procedure for Tools – Policy 29.

Cranes and Rigging☐

Yes

☒

No

If yes, specify precautions to be taken:

Not expected. See ATC health and safety policy and procedure for Cranes and Rigging – Policy 11.

Lockout – Tagout (Energy Control)☒

Yes

☐

No

If yes, specify precautions to be taken:

Not expected – SSUSC must provide documentation that the vessel is not energized, prior to the sampling activities.

See ATC health and safety policy and procedure for Energy Control – Policy 14.

Motor Vehicle Operation☒

Yes

☐

No

If yes, specify precautions to be taken:

Any motor vehicle used to conduct company-related business shall be operated safely in accordance with jurisdictional highway/roadway laws and ATC Associates requirements.

See ATC health and safety policy and procedure for Vehicle Safety – Policy 30.

Respiratory Protection☒

Yes

☐

No

If yes, specify precautions to be taken:

Half face respirators will be required during sample collection activities.

See ATC health and safety policy and procedure for Respiratory Protection – Policy 27.

Stairways and Ladders☒

Yes

☐

No

If yes, specify precautions to be taken:

The ship contains numerous stairways and ladders that provide access to the different decks.

See ATC health and safety policy and procedure for Ladders – Policy 24.

Presence of Underground Utilities – Not Applicable

Have underground utilities been located and marked at the site? ☐ Yes ☐ No ☒ NA

If yes, have the requirements of manual section 33 – Subsurface Investigations been followed? To be completed during mobilization. ☐ Yes ☐ No
(Attach completed Checklist for Subsurface Clearance - Appendix 33-1)

Specify names and phone number of utilities contact:

Name of Contact(s) Not Applicable

Phone Number _____

Field Identified Hazards ☒ Yes ☐ No If yes, specify precautions to be taken:

In the event that unanticipated hazards are identified in the field, the Site Health and Safety Officer shall prepare an addendum to this Health and Safety Plan to address the hazard prior to conducting any work that may be affected by the hazard. Additional Policies included are Subcontractor Management – Policy 5, Employee Communications Training – Policy 8, Fire Safety – Policy 18 and First Aid – Policy 20.

Copies of ATC's Safety Policies can be found in **Attachment 8-3**.

9.0 Chemical Hazard Analysis (1910.120(b)(4))

The main possible chemical hazard to site personnel includes polychlorinated biphenyls. Applicable Material Data Safety Sheets (MSDS) can be found in **Attachment 8-4**.

Potential Routes of Exposure

Dermal: Contact with contaminated media. May be absorbed through the skin in harmful amounts. May cause irritation with burning pain, itching and redness. Prolonged or repeated skin contact may cause defatting and dermatitis. This route of exposure is minimized through proper use of Personal Protection Equipment (PPE).

Inhalation: Causes irritation to the respiratory tract. Symptoms may include coughing, shortness of breath. Inhalation of high concentrations may cause central nervous system effects characterized by nausea, headache, dizziness, unconsciousness and coma. This route of exposure is minimized through proper use of PPE.

Ingestion: Inadvertent ingestion of contaminated media. Ingestion of large amounts may cause gastrointestinal irritation. May cause liver and kidney damage. May cause central nervous system depression, characterized by excitement, followed by headache, dizziness, drowsiness, and nausea. Advanced stages may cause collapse, unconsciousness, coma and possible death due to respiratory failure. May cause vascular collapse and damage. Aspiration of material into the lungs may cause chemical pneumonitis, which may be fatal. This route should not present a concern if good hygiene practices are followed (e.g., wash hands and face before drinking or smoking).

Other: Eye Contact: May cause irritation, redness, and pain. This route of exposure is minimized through proper use of PPE.

All site personnel (includes subcontractors) are required to comply with the training requirements specified in Section 8.14 of this HASP.

10.0 ATC Associates Subcontractors

All subcontractors used at the Site will be **Pre-Approved** in the ATC Subcontractor Prequalification System.

The subcontractors listed above are covered by this HASP and must be provided a copy of this document. However, this plan does not address hazards associated with the tasks and equipment that the subcontractor has expertise in (e.g., drilling, excavation work, electrical). Subcontractors are responsible for the health and safety procedures specific to their work, and are required to submit these procedures to ATC for review before the start of field work. Subcontractors must comply with all established health and safety plan(s) for this project. The Site Health and Safety Officer should verify that subcontractor employee training, medical clearance, and fit test records are current and must monitor and enforce compliance with the established Health and Safety plan(s). ATC's oversight does not relieve subcontractors of their responsibility for effective implementation and compliance with the established plan(s). ATC team members should continuously endeavor to observe subcontractors' safety performance. This endeavor should be reasonable, and include observation of hazards or unsafe practices that are both readily observable and occur in common work areas. ATC is not responsible for exhaustive observation for hazards and unsafe practices. However, when apparent, non-compliance/unsafe conditions or practices are observed, ATC will notify the subcontractor safety representative and require corrective action to be undertaken.

All site personnel (includes subcontractors) are required to comply with the training requirements specified in Section 8.14 of this HASP

11.0 Personal Protective Equipment (1910.120(b)(4))

Based on evaluation of potential hazards, the following levels of personal protection have been designated for the applicable work zones:

<u>Work Zone</u>	<u>Level of Protection</u>	<u>Required Protective Equipment</u>	
Command Post (Located at ATC vehicle at Pier 82)	Modified D	Respirator:	No
		Filters/Cartridges:	n/a
		Boots:	yes
		Inner Gloves:	Nitrile
		Outer Gloves:	Nitrile
		Protective Coverall:	n/a
		Hard Hat:	Yes
		Eye Protection:	Yes
		Other:	Hearing Protection While Equipment Operating; Flashlight or Head Lamp
Sampling Zones (Exclusion Zone)	Modified Level C	Respirator:	YES
		Filters/Cartridges:	P100
		Boots:	yes
		Inner Gloves:	Nitrile
		Outer Gloves:	Nitrile
		Protective Coverall:	Tyvek
		Hard Hat:	Yes
		Eye Protection:	Yes
		Other:	Hearing Protection While Equipment Operating; Flashlight or Head Lamp
Contamination Reduction Zone (Located at B Deck Hatch)	Modified Level C	Respirator:	YES
		Filters/Cartridges:	N/A

Boots:	Yes
Inner Gloves:	No
Outer Gloves:	Yes
Protective Coverall:	Tyvek
Hard Hat:	Yes
Eye Protection:	Yes
Other:	

Exceptions and Modifications:

12.0 Decontamination (1910.120(k))

Personnel Decontamination Procedures

All personnel entering the Exclusion Zone will undergo decontamination prior to leaving the site. Personnel will proceed through the following decontamination stations:

Decontamination Solution: Soap and water, fresh water rinse

STATION #1: Wash hands, dispose of outer gloves.

Equipment Required: Tub, brush, disposal container.

STATION #2: NA

Equipment Required: _____

Equipment Decontamination

Gross Removal By:

<u>X</u>	Hand Scrubbing
_____	Cold High Pressure Wash
_____	Hot High Pressure Wash
_____	Steam Cleaning
_____	Other (specify) _____
_____	Clean Rinse
<u>X</u>	Decon solution (specify) <u>LIQUINOX</u>

Decontamination Waste Water

Water to be collected in PVC container.

Collection (specify how): _____

Direct Discharge (specify how and where): _____

n/a

Pre-Treatment (specify): _____

Disposal (specify how and where): _____

13.0 Site Security

Security on site will be maintained by:

<u> X </u>	Site Sign in Log
<u> </u>	Security Fencing- around site
<u> X </u>	24 Hour Security

14.0 Training

Pre-Assignment and Annual Refresher Training: All ATC Employees and Subcontractors will participate in routine health and safety education and training programs. These programs are designed to provide employees with a thorough knowledge of hazardous materials, health and safety hazard potential, and Federal Occupational Safety and Health Administration (OSHA) requirements published in 29 Code of Federal Regulations (CFR) Part 1910. According to 29 CFR 1910.120(e), Site employees will have received 40 hours of initial Hazardous Waste Operations & Emergency Response (HAZWOPER) instruction and 24 hours of supervised field experience. Attending an annual 8-hour HAZWOPER refresher training session maintains this initial training. It is the responsibility of the ATC Project Manager and each subcontractor's supervising manager to determine if the subcontractor staff meets these training requirements.

Site Supervisor's Training: On-site Managers and Supervisors on hazardous waste sites who are directly responsible for or who supervise workers engaged in hazardous wastes operations receive, in addition to the initial 40 HAZWOPER training, eight (8) additional hours of specialized supervisory training in compliance with the OSHA regulations. This training includes training on the employer's safety and health program and the associated employee training program, personal protective equipment program, spill containment program, and health hazards monitoring procedure and techniques.

Site Safety Training and Briefing Topics: The Project Safety Officer will conduct Site-specific health and safety briefing for field personnel before the start of all field work. Briefing attendees will include the ATC Project Manager, the Project Team, and Subcontractor personnel. At the conclusion of the meeting, personnel are to sign the HASP Agreement and Acknowledgement Form in Section 8.17 of this HASP. As additional people are assigned to the Site, it is the responsibility of the Project Safety Officer to ensure that new personnel are briefed on health and safety protocols and ensure that they have reviewed and signed the HASP Agreement and Acknowledgement Form. Items to be covered include:

- Contents of this HASP;
- Site-specific health and safety rules;
- Client-specific health and safety rules;
- Health effects of various chemicals used on the Site; and
- Emergency response actions pertaining to operations on-Site.

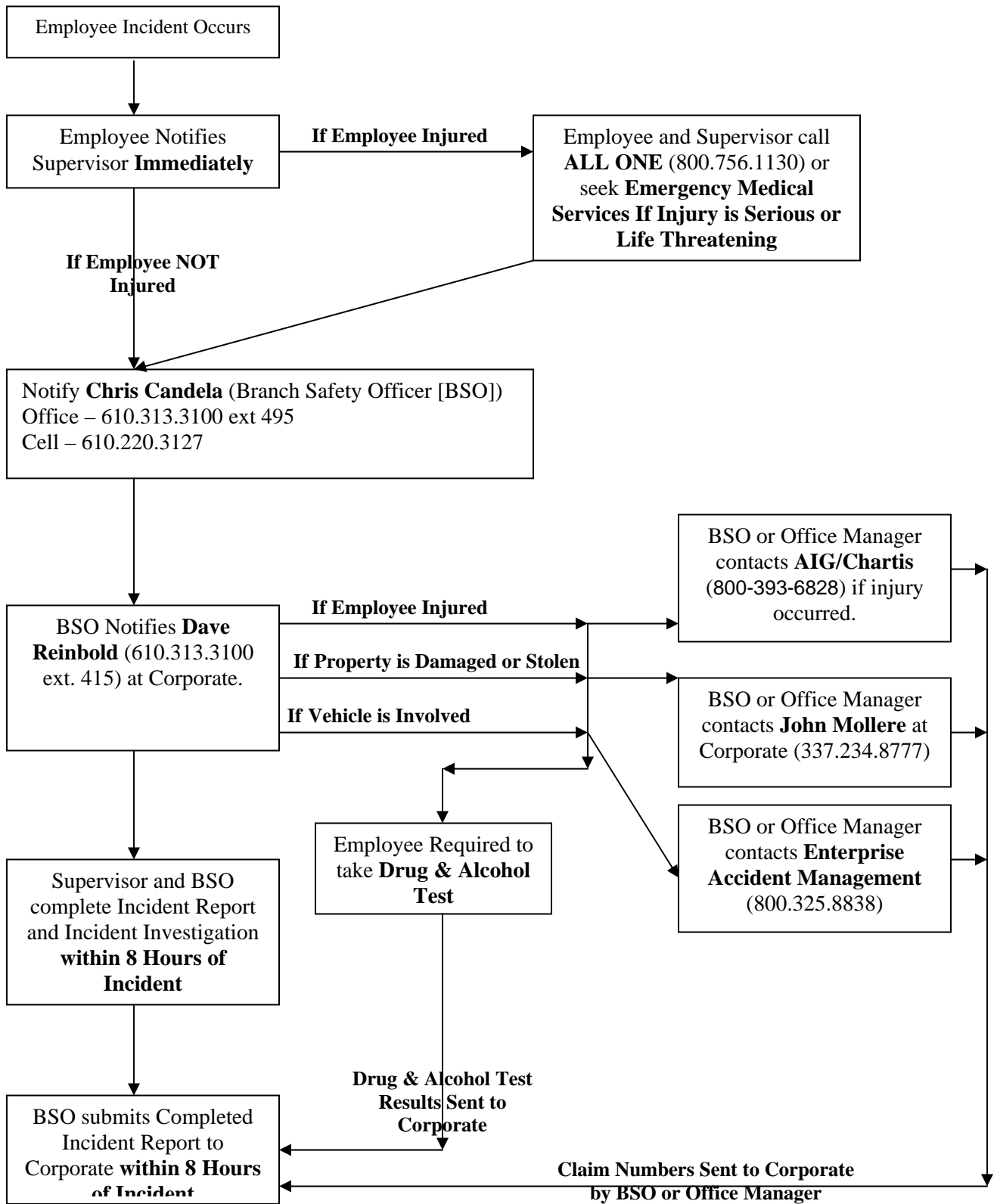
Additionally, daily Site Tailgate Safety Meetings will be conducted to review past activities, plan ahead for new or changed operations, to understand any near-miss and "lessons learned, establish safe working procedures for anticipated hazards, and provide pertinent safety and health training and motivation. The Project Safety Officer will complete the Tailgate Safety Meeting Form located in the Appendices.

Visitors: All visitors entering the designated work zones will be subject to all applicable

health and safety requirements during field operations at the Site. All visitors to a work Site will be given the opportunity to review the HASP, will be escorted at all times, and will be required to stay a safe distance from Site activities. The Site Supervisor and/or the Project Safety Officer will be responsible for briefing all visitors on the Site hazards, Site safety precautions, and the Site emergency response plan.

15.0 Incident Reporting and Investigation

The purpose of this Section is to establish procedures to ensure all incidents are properly reported, documented, investigated, communicated, and managed. In the case of regulatory agencies and insurance carriers, proper and timely communications and documentation of incidents is critical. The following provides an outline of the reporting process:



Additional information and forms can be found in ATC Safety Policy Number 51 which is included in **Attachment 8-5**.

16.0 Contingency Plan (1910.120(l))

Emergency Communication Signal(s) (specify): Radios will be carried by each sampling team and will be used for verbal communications. Mobile phones will be carried by key individuals and will be used as well as hand and verbal communication/signals.

Emergency Escape Route(s) (specify and indicate on site diagram): In the event of an emergency, all site personnel are to report to the Pier 82 Entrance Guard Shack.

Emergency Equipment On Site: (specify location):

First Aid Kit: ATC Vehicles and ATC's Command Post

Fire Extinguishers: ATC Vehicles and ATC's Command Post

Telephone: Cell Phone

Eye Wash/Safety Shower: ATC's Command Post

Others (specify): Personnel Flotation Device (PFD) at ATC's Command Post

Re-entry to the Exclusion Zone following an on-site emergency shall not be permitted until the following conditions are satisfied:

- (1) The conditions resulting in an emergency have been corrected.
- (2) The hazards have been re-evaluated.
- (3) The HASP has been reviewed and determined adequate for the hazards encountered.
- (4) All site personnel have been instructed in any new hazards and changes to the HASP.

OTHER REQUIRED INFORMATION

In order to comply with OSHA standards, the following documents **MUST** be maintained on site:

- 1) Hazard Communication Manual (1910.1200)
- 2) Chemical List and Material Safety Data Sheets for all chemicals (1910.1200)
- 3) Latest medical summary for all personnel (1910.120)
- 4) Documentation of current OSHA training

17.0 Employee Signoff Form

[illegible]

<u>NAME</u>	<u>SIGNATURE</u>	<u>DATE</u>

Appendix A

Job Safety Analyses



JSA

JOB SAFETY ANALYSIS

For RM Department Use
JSA NO:
Primary Job Category:

DESCRIPTION OF JOB: Underground Utility Locating – Site Walk Through

REVISION DATE:

JSA CREATED ON: 26Jan09

PREPARED BY: C. Candela

REVIEWED BY: D. Reinbold

APPROVED BY: D. Reinbold

PAGE: 1 of 1

MINIMUM REQUIRED PERSONAL PROTECTIVE EQUIPMENT

<input checked="" type="checkbox"/> REFLECTIVE VEST <input checked="" type="checkbox"/> HARD HAT <input checked="" type="checkbox"/> SAFETY TOED BOOTS <input checked="" type="checkbox"/> SAFETY GLASSES <input type="checkbox"/> FACE SHIELD	<input checked="" type="checkbox"/> LONG PANTS <input checked="" type="checkbox"/> COTTON, LEATHER, OR CRAFTSMAN GLOVES <input type="checkbox"/> CHEMICAL RESISTANT GLOVE: <input type="checkbox"/> HEARING PROTECTION	<input type="checkbox"/> AIR PURIFYING RESPIRATOR <input type="checkbox"/> SUPPLIED AIR RESPIRATOR <input type="checkbox"/> CHEMICAL RESISTANT CLOTHING: <input type="checkbox"/> GOGGLES	<input type="checkbox"/> OTHER: <input type="checkbox"/> OTHER: <input type="checkbox"/> OTHER: <input type="checkbox"/> OTHER: <input type="checkbox"/> OTHER:
------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------

REQUIRED TOOLS/EQUIPMENT/SUPPLIES

<input type="checkbox"/> DRINKING WATER <input checked="" type="checkbox"/> BUG REPELLENT <input checked="" type="checkbox"/> TRAFFIC CONTROL DEVICES <input type="checkbox"/> LADDER	<input type="checkbox"/> RATCHET WITH EXTENSION <input type="checkbox"/> WELL MAGNET <input type="checkbox"/> AIR MONITORING SELECT FROM LIST <input type="checkbox"/> LOCKOUT/TAGOUT EQUIPMENT	<input type="checkbox"/> OTHER: <input type="checkbox"/> OTHER: <input type="checkbox"/> OTHER: <input type="checkbox"/> OTHER:	<input type="checkbox"/> OTHER: <input type="checkbox"/> OTHER: <input type="checkbox"/> OTHER: <input type="checkbox"/> OTHER:
------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------

1 JOB STEPS	2 POTENTIAL HAZARDOUS CONDITIONS or UNSAFE PRACTICES	3 SAFE PROCEDURES and PREVENTATIVE MEASURES
Walk site	Trip hazards	<ul style="list-style-type: none">• Always look at where you step• Clear vegetation if needed• Wear steel toed boots with ankle support
	Vehicles	<ul style="list-style-type: none">• Wear a safety reflective vest• Walk with a spotter• Be aware of your surroundings
	Heavy equipment	<ul style="list-style-type: none">• Wear a safety reflective vest• Walk with a spotter• Be aware of your surroundings• Heavy equipment operation will not occur while utility locating is being conducted.
	Weather	<ul style="list-style-type: none">• Dress appropriately for the weather• Wear layers• Drink fluids



JSA

JOB SAFETY ANALYSIS

For RM Department Use
JSA NO:
Primary Job Category:

DESCRIPTION OF JOB: Site Set Up / Tear Down

REVISION DATE:

JSA CREATED ON: 26Jan09

PREPARED BY: C. Candela

REVIEWED BY: D. Reinbold

APPROVED BY: D. Reinbold

PAGE: 1 of 4

MINIMUM REQUIRED PERSONAL PROTECTIVE EQUIPMENT

<input checked="" type="checkbox"/> REFLECTIVE VEST <input checked="" type="checkbox"/> HARD HAT <input checked="" type="checkbox"/> SAFETY TOED BOOTS <input checked="" type="checkbox"/> SAFETY GLASSES <input type="checkbox"/> FACE SHIELD	<input checked="" type="checkbox"/> LONG PANTS <input checked="" type="checkbox"/> COTTON, LEATHER, OR CRAFTSMAN GLOVES <input type="checkbox"/> CHEMICAL RESISTANT GLOVE: <input checked="" type="checkbox"/> HEARING PROTECTION	<input type="checkbox"/> AIR PURIFYING RESPIRATOR <input type="checkbox"/> SUPPLIED AIR RESPIRATOR <input type="checkbox"/> CHEMICAL RESISTANT CLOTHING: <input type="checkbox"/> GOGGLES	<input type="checkbox"/> OTHER: <input type="checkbox"/> OTHER: <input type="checkbox"/> OTHER: <input type="checkbox"/> OTHER: <input type="checkbox"/> OTHER:
------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------

REQUIRED TOOLS/EQUIPMENT/SUPPLIES

<input checked="" type="checkbox"/> DRINKING WATER <input checked="" type="checkbox"/> BUG REPELLENT <input checked="" type="checkbox"/> TRAFFIC CONTROL DEVICES <input type="checkbox"/> LADDER	<input type="checkbox"/> RATCHET WITH EXTENSION <input type="checkbox"/> WELL MAGNET <input type="checkbox"/> AIR MONITORING SELECT FROM LIST <input type="checkbox"/> LOCKOUT/TAGOUT EQUIPMENT	<input type="checkbox"/> OTHER: <input type="checkbox"/> OTHER: <input type="checkbox"/> OTHER: <input type="checkbox"/> OTHER:	<input type="checkbox"/> OTHER: <input type="checkbox"/> OTHER: <input type="checkbox"/> OTHER: <input type="checkbox"/> OTHER:
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------

1 JOB STEPS	2 POTENTIAL HAZARDOUS CONDITIONS or UNSAFE PRACTICES	3 SAFE PROCEDURES and PREVENTATIVE MEASURES
Drive to and from site	Traffic	<ul style="list-style-type: none">• Use defensive driving techniques
	Pedestrians	<ul style="list-style-type: none">• Yield to all pedestrians.• Use defensive driving techniques
Load/Unload equipment and supplies	Vehicles	<ul style="list-style-type: none">• When backing the drill rig or other large vehicles a spotter must be used.• Use barrier controls with a height of at least 36 inches.• Wear traffic reflective vest.• Caution tape or snow fence should be used to surround the work site.
	Pedestrians	<ul style="list-style-type: none">• Use barrier controls with a height of at least 36 inches.• Place signs indicating authorized personnel only at intervals of 20 feet.• When backing the drill rig or other large vehicles a spotter must be used.• Caution tape or snow fence should be used to surround the work site.
	Weather	<ul style="list-style-type: none">• Prevent heat and cold illnesses by: drinking water frequently and moderately; rest frequently; wear light colored clothing; eat light meals.• Adjust work schedule to avoid temperature extremes.• Sunscreen• Layer clothing to adjust to changing environmental temperatures



JSA

JOB SAFETY ANALYSIS

For RM Department Use
JSA NO:
Primary Job Category:

DESCRIPTION OF JOB: Site Set Up / Tear Down

REVISION DATE:

JSA CREATED ON: 26Jan09

PREPARED BY: C. Candela

REVIEWED BY: D. Reinbold

APPROVED BY: D. Reinbold

PAGE: 2 of 4

MINIMUM REQUIRED PERSONAL PROTECTIVE EQUIPMENT

<input checked="" type="checkbox"/> REFLECTIVE VEST	<input checked="" type="checkbox"/> LONG PANTS	<input type="checkbox"/> AIR PURIFYING RESPIRATOR	<input type="checkbox"/> OTHER:
<input checked="" type="checkbox"/> HARD HAT	<input checked="" type="checkbox"/> COTTON, LEATHER, OR CRAFTSMAN GLOVES	<input type="checkbox"/> SUPPLIED AIR RESPIRATOR	<input type="checkbox"/> OTHER:
<input checked="" type="checkbox"/> SAFETY TOED BOOTS	<input type="checkbox"/> CHEMICAL RESISTANT GLOVE:	<input type="checkbox"/> CHEMICAL RESISTANT CLOTHING:	<input type="checkbox"/> OTHER:
<input checked="" type="checkbox"/> SAFETY GLASSES	<input checked="" type="checkbox"/> HEARING PROTECTION	<input type="checkbox"/> GOGGLES	<input type="checkbox"/> OTHER:
<input type="checkbox"/> FACE SHIELD			

REQUIRED TOOLS/EQUIPMENT/SUPPLIES

<input checked="" type="checkbox"/> DRINKING WATER	<input type="checkbox"/> RATCHET WITH EXTENSION	<input type="checkbox"/> OTHER:	<input type="checkbox"/> OTHER:
<input checked="" type="checkbox"/> BUG REPELLENT	<input type="checkbox"/> WELL MAGNET	<input type="checkbox"/> OTHER:	<input type="checkbox"/> OTHER:
<input checked="" type="checkbox"/> TRAFFIC CONTROL DEVICES	<input type="checkbox"/> AIR MONITORING SELECT FROM LIST	<input type="checkbox"/> OTHER:	<input type="checkbox"/> OTHER:
<input type="checkbox"/> LADDER	<input type="checkbox"/> LOCKOUT/TAGOUT EQUIPMENT	<input type="checkbox"/> OTHER:	<input type="checkbox"/> OTHER:

1 JOB STEPS	2 POTENTIAL HAZARDOUS CONDITIONS or UNSAFE PRACTICES	3 SAFE PROCEDURES and PREVENTATIVE MEASURES
		<ul style="list-style-type: none">Avoid drinks with caffeine (coffee, tea, or soda) or alcohol.Use the buddy system (work in pairs).
	Slips, trips and falls	<ul style="list-style-type: none">Maintain housekeeping.Set up work zone with enough room for staging of equipment and supplies such that there are aisle ways for walking and working.If on pavement or concrete sweep up loose sand, dirt or rockWear slip resistant steel toed boots.Keep foot wear clean of mud and other debris.Setup areas away from snow and ice.If ice is present wear yak-traks on boots.
	Insects and animals	<ul style="list-style-type: none">Look around area before setting up for the presence of bee nests and cob webs.Do not disturb – leave them alone.If stray dogs are present go indoors or the cab of the truck and wait for it to leave. Call animal control.If you encounter bees or poisonous spiders leave the area and call the Project Manager.Keep hands and feet out of areas you can not see.
	Back Injuries	<ul style="list-style-type: none">Use proper lifting procedures – avoid lifting with the back and twisting.Do not lift over 50 pounds without assistance.



JSA

JOB SAFETY ANALYSIS

For RM Department Use
JSA NO:
Primary Job Category:

DESCRIPTION OF JOB: Site Set Up / Tear Down

REVISION DATE:

JSA CREATED ON: 26Jan09

PREPARED BY: C. Candela

REVIEWED BY: D. Reinbold

APPROVED BY: D. Reinbold

PAGE: 3 of 4

MINIMUM REQUIRED PERSONAL PROTECTIVE EQUIPMENT

<input checked="" type="checkbox"/> REFLECTIVE VEST <input checked="" type="checkbox"/> HARD HAT <input checked="" type="checkbox"/> SAFETY TOED BOOTS <input checked="" type="checkbox"/> SAFETY GLASSES <input type="checkbox"/> FACE SHIELD	<input checked="" type="checkbox"/> LONG PANTS <input checked="" type="checkbox"/> COTTON, LEATHER, OR CRAFTSMAN GLOVES <input type="checkbox"/> CHEMICAL RESISTANT GLOVE: <input checked="" type="checkbox"/> HEARING PROTECTION	<input type="checkbox"/> AIR PURIFYING RESPIRATOR <input type="checkbox"/> SUPPLIED AIR RESPIRATOR <input type="checkbox"/> CHEMICAL RESISTANT CLOTHING: <input type="checkbox"/> GOGGLES	<input type="checkbox"/> OTHER: <input type="checkbox"/> OTHER: <input type="checkbox"/> OTHER: <input type="checkbox"/> OTHER: <input type="checkbox"/> OTHER:
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REQUIRED TOOLS/EQUIPMENT/SUPPLIES

<input checked="" type="checkbox"/> DRINKING WATER <input checked="" type="checkbox"/> BUG REPELLENT <input checked="" type="checkbox"/> TRAFFIC CONTROL DEVICES <input type="checkbox"/> LADDER	<input type="checkbox"/> RATCHET WITH EXTENSION <input type="checkbox"/> WELL MAGNET <input type="checkbox"/> AIR MONITORING SELECT FROM LIST <input type="checkbox"/> LOCKOUT/TAGOUT EQUIPMENT	<input type="checkbox"/> OTHER: <input type="checkbox"/> OTHER: <input type="checkbox"/> OTHER: <input type="checkbox"/> OTHER:	<input type="checkbox"/> OTHER: <input type="checkbox"/> OTHER: <input type="checkbox"/> OTHER: <input type="checkbox"/> OTHER:
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1 JOB STEPS	2 POTENTIAL HAZARDOUS CONDITIONS or UNSAFE PRACTICES	3 SAFE PROCEDURES and PREVENTATIVE MEASURES
	Hand Injuries	<ul style="list-style-type: none">Wear work gloves – leather or craftsman while setting up.Watch hand placement – always know where your hands are at.Do not place your hand in direct path of a tool or between two objects.
	Heavy Equipment	<ul style="list-style-type: none">Spotters must be used at all times when heavy equipment is being operated.All onsite personnel must wear safety reflective vest.Operator must follow spotters hand signals and remove hands from controls when not working.Site personnel should only approach the spotterBackup alarm is required on heavy equipment.
Underground Utility Locate	Vehicles	<ul style="list-style-type: none">Wear traffic reflective vest.A spotter should walk with the utility locator looking for hazards whenever the locator is looking down.
	Weather	<ul style="list-style-type: none">Prevent heat and cold illnesses by: drinking water frequently and moderately; rest frequently; wear light colored clothing; eat light meals.Adjust work schedule to avoid temperature extremes.SunscreenLayer clothing to adjust to changing environmental temperaturesAvoid drinks with caffeine (coffee, tea, or soda) or alcohol.



JSA

JOB SAFETY ANALYSIS

For RM Department Use
JSA NO:
Primary Job Category:

DESCRIPTION OF JOB: Site Set Up / Tear Down

REVISION DATE:

JSA CREATED ON: 26Jan09

PREPARED BY: C. Candela

REVIEWED BY: D. Reinbold

APPROVED BY: D. Reinbold

PAGE: 4 of 4

MINIMUM REQUIRED PERSONAL PROTECTIVE EQUIPMENT

- ☒ REFLECTIVE VEST
- ☒ HARD HAT
- ☒ SAFETY TOED BOOTS
- ☒ SAFETY GLASSES
- ☐ FACE SHIELD

- ☒ LONG PANTS
- ☒ COTTON, LEATHER, OR CRAFTSMAN GLOVES
- ☐ CHEMICAL RESISTANT GLOVE:
- ☒ HEARING PROTECTION

- ☐ AIR PURIFYING RESPIRATOR
- ☐ SUPPLIED AIR RESPIRATOR
- ☐ CHEMICAL RESISTANT CLOTHING:
- ☐ GOGGLES

- ☐ OTHER:
- ☐ OTHER:
- ☐ OTHER:
- ☐ OTHER:
- ☐ OTHER:

REQUIRED TOOLS/EQUIPMENT/SUPPLIES

- ☒ DRINKING WATER
- ☒ BUG REPELLENT
- ☒ TRAFFIC CONTROL DEVICES
- ☐ LADDER

- ☐ RATCHET WITH EXTENSION
- ☐ WELL MAGNET
- ☐ AIR MONITORING **SELECT FROM LIST**
- ☐ LOCKOUT/TAGOUT EQUIPMENT

- ☐ OTHER:
- ☐ OTHER:
- ☐ OTHER:
- ☐ OTHER:

- ☐ OTHER:
- ☐ OTHER:
- ☐ OTHER:
- ☐ OTHER:

1 JOB STEPS	2 POTENTIAL HAZARDOUS CONDITIONS or UNSAFE PRACTICES	3 SAFE PROCEDURES and PREVENTATIVE MEASURES
		<ul style="list-style-type: none">Use the buddy system (work in pairs).
	Slips, trips and falls	<ul style="list-style-type: none">Wear slip resistant steel toed boots with ankle support.Keep foot wear clean of mud and other debris.If ice is present wear yak-traks on boots.
	Insects and animals	<ul style="list-style-type: none">Look around area before setting up for the presence of bee nests and cob webs.Do not disturb – leave them alone.If stray dogs are present go indoors or the cab of the truck and wait for it to leave. Call animal control.If you encounter bees or poisonous spiders leave the area and call the Project Manager.Keep hands and feet out of areas you can not see.
		<ul style="list-style-type: none">
		<ul style="list-style-type: none">
		<ul style="list-style-type: none">
		<ul style="list-style-type: none">



JSA

JOB SAFETY ANALYSIS

For RM Department Use
JSA NO:
Primary Job Category:

DESCRIPTION OF JOB: Pump – Fuel Transfer

REVISION DATE:

JSA CREATED ON: 26Jan09

PREPARED BY: C. Candela

REVIEWED BY: D. Reinbold

APPROVED BY: D. Reinbold

PAGE: 1 of 2

MINIMUM REQUIRED PERSONAL PROTECTIVE EQUIPMENT

- | | | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input checked="" type="checkbox"/> REFLECTIVE VEST
<input checked="" type="checkbox"/> HARD HAT
<input checked="" type="checkbox"/> SAFETY TOED BOOTS
<input checked="" type="checkbox"/> SAFETY GLASSES
<input checked="" type="checkbox"/> FACE SHIELD | <input checked="" type="checkbox"/> LONG PANTS
<input type="checkbox"/> COTTON, LEATHER, OR CRAFTSMAN GLOVES
<input checked="" type="checkbox"/> CHEMICAL RESISTANT GLOVE:
<input type="checkbox"/> HEARING PROTECTION | <input type="checkbox"/> AIR PURIFYING RESPIRATOR
<input type="checkbox"/> SUPPLIED AIR RESPIRATOR
<input type="checkbox"/> CHEMICAL RESISTANT CLOTHING:
<input type="checkbox"/> GOGGLES | <input checked="" type="checkbox"/> OTHER: Chainsaw Chaps
<input type="checkbox"/> OTHER:
<input type="checkbox"/> OTHER:
<input type="checkbox"/> OTHER:
<input type="checkbox"/> OTHER: |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

REQUIRED TOOLS/EQUIPMENT/SUPPLIES

- | | | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/> DRINKING WATER
<input type="checkbox"/> BUG REPELLENT
<input type="checkbox"/> TRAFFIC CONTROL DEVICES
<input type="checkbox"/> LADDER | <input type="checkbox"/> RATCHET WITH EXTENSION
<input type="checkbox"/> WELL MAGNET
<input type="checkbox"/> AIR MONITORING SELECT FROM LIST
<input type="checkbox"/> LOCKOUT/TAGOUT EQUIPMENT | <input type="checkbox"/> OTHER:
<input type="checkbox"/> OTHER:
<input type="checkbox"/> OTHER:
<input type="checkbox"/> OTHER: | <input type="checkbox"/> OTHER:
<input type="checkbox"/> OTHER:
<input type="checkbox"/> OTHER:
<input type="checkbox"/> OTHER: |
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1 JOB STEPS	2 POTENTIAL HAZARDOUS CONDITIONS or UNSAFE PRACTICES	3 SAFE PROCEDURES and PREVENTATIVE MEASURES
Fueling	Fire	<ul style="list-style-type: none">• Eliminate all sources of ignition• Clean up any spilled fuel• Fill stem to be bonded to container during filling• Fire extinguisher present• Wait for fumes to dissipate before starting any engines
	Chemical Contact	<ul style="list-style-type: none">• Prevent splashing of fuel• Wear Safety Glasses• Wear appropriate gloves
	Inhalation	<ul style="list-style-type: none">• Operate in open well-ventilated area



JSA

JOB SAFETY ANALYSIS

For RM Department Use
JSA NO:
Primary Job Category:

DESCRIPTION OF JOB: Pump – Fuel Transfer

REVISION DATE:

JSA CREATED ON: 26Jan09

PREPARED BY: C. Candela

REVIEWED BY: D. Reinbold

APPROVED BY: D. Reinbold

PAGE: 2 of 2

MINIMUM REQUIRED PERSONAL PROTECTIVE EQUIPMENT

- | | | | |
|-------------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------|-----------------------------------------------------------|
| <input checked="" type="checkbox"/> REFLECTIVE VEST | <input checked="" type="checkbox"/> LONG PANTS | <input type="checkbox"/> AIR PURIFYING RESPIRATOR | <input checked="" type="checkbox"/> OTHER: Chainsaw Chaps |
| <input checked="" type="checkbox"/> HARD HAT | <input type="checkbox"/> COTTON, LEATHER, OR CRAFTSMAN GLOVES | <input type="checkbox"/> SUPPLIED AIR RESPIRATOR | <input type="checkbox"/> OTHER: |
| <input checked="" type="checkbox"/> SAFETY TOED BOOTS | <input checked="" type="checkbox"/> CHEMICAL RESISTANT GLOVE: | <input type="checkbox"/> CHEMICAL RESISTANT CLOTHING: | <input type="checkbox"/> OTHER: |
| <input checked="" type="checkbox"/> SAFETY GLASSES | <input type="checkbox"/> HEARING PROTECTION | <input type="checkbox"/> GOGGLES | <input type="checkbox"/> OTHER: |
| <input checked="" type="checkbox"/> FACE SHIELD | | | |

REQUIRED TOOLS/EQUIPMENT/SUPPLIES

- | | | | |
|--------------------------------------------------|-----------------------------------------------------------------|---------------------------------|---------------------------------|
| <input type="checkbox"/> DRINKING WATER | <input type="checkbox"/> RATCHET WITH EXTENSION | <input type="checkbox"/> OTHER: | <input type="checkbox"/> OTHER: |
| <input type="checkbox"/> BUG REPELLENT | <input type="checkbox"/> WELL MAGNET | <input type="checkbox"/> OTHER: | <input type="checkbox"/> OTHER: |
| <input type="checkbox"/> TRAFFIC CONTROL DEVICES | <input type="checkbox"/> AIR MONITORING SELECT FROM LIST | <input type="checkbox"/> OTHER: | <input type="checkbox"/> OTHER: |
| <input type="checkbox"/> LADDER | <input type="checkbox"/> LOCKOUT/TAGOUT EQUIPMENT | <input type="checkbox"/> OTHER: | <input type="checkbox"/> OTHER: |

1
JOB STEPS

2
POTENTIAL HAZARDOUS CONDITIONS or
UNSAFE PRACTICES

3
SAFE PROCEDURES and PREVENTATIVE MEASURES



JSA

JOB SAFETY ANALYSIS

For RM Department Use
JSA NO:
Primary Job Category:

DESCRIPTION OF JOB: Portable Generator – Gasoline Powered		REVISION DATE:	JSA CREATED ON: 26Jan09
PREPARED BY: C. Candela	REVIEWED BY: D. Reinbold	APPROVED BY: D. Reinbold	PAGE: 1 of 2

MINIMUM REQUIRED PERSONAL PROTECTIVE EQUIPMENT

<input type="checkbox"/> REFLECTIVE VEST	<input checked="" type="checkbox"/> LONG PANTS	<input type="checkbox"/> AIR PURIFYING RESPIRATOR	<input type="checkbox"/> OTHER: Chainsaw Chaps
<input type="checkbox"/> HARD HAT	<input checked="" type="checkbox"/> COTTON, LEATHER, OR CRAFTSMAN GLOVES	<input type="checkbox"/> SUPPLIED AIR RESPIRATOR	<input type="checkbox"/> OTHER:
<input checked="" type="checkbox"/> SAFETY TOED BOOTS	<input type="checkbox"/> CHEMICAL RESISTANT GLOVE:	<input type="checkbox"/> CHEMICAL RESISTANT CLOTHING:	<input type="checkbox"/> OTHER:
<input checked="" type="checkbox"/> SAFETY GLASSES	<input type="checkbox"/> HEARING PROTECTION	<input type="checkbox"/> GOGGLES	<input type="checkbox"/> OTHER:
<input type="checkbox"/> FACE SHIELD			<input type="checkbox"/> OTHER:

REQUIRED TOOLS/EQUIPMENT/SUPPLIES

<input type="checkbox"/> DRINKING WATER	<input type="checkbox"/> RATCHET WITH EXTENSION	<input type="checkbox"/> OTHER:	<input type="checkbox"/> OTHER:
<input type="checkbox"/> BUG REPELLENT	<input type="checkbox"/> WELL MAGNET	<input type="checkbox"/> OTHER:	<input type="checkbox"/> OTHER:
<input type="checkbox"/> TRAFFIC CONTROL DEVICES	<input type="checkbox"/> AIR MONITORING SELECT FROM LIST	<input type="checkbox"/> OTHER:	<input type="checkbox"/> OTHER:
<input type="checkbox"/> LADDER	<input type="checkbox"/> LOCKOUT/TAGOUT EQUIPMENT	<input type="checkbox"/> OTHER:	<input type="checkbox"/> OTHER:

1 JOB STEPS	2 POTENTIAL HAZARDOUS CONDITIONS or UNSAFE PRACTICES	3 SAFE PROCEDURES and PREVENTATIVE MEASURES
Fueling	Fire	<ul style="list-style-type: none"> Eliminate all sources of ignition Clean up any spilled fuel Fill stem to be bonded to container during filling Fire extinguisher present Wait for fumes to dissipate before starting any engines Fuel unit on ground – NOT in truck bed, etc.
	Chemical Contact	<ul style="list-style-type: none"> Prevent splashing of fuel Wear appropriate gloves
	Inhalation	<ul style="list-style-type: none"> Operate in open well-ventilated area
Unload/Load Machine	Back Injuries	<ul style="list-style-type: none"> Use proper lifting procedures – avoid lifting with the back and twisting. If over 50 pounds or awkward ask for assistance.
	Hand Injuries	<ul style="list-style-type: none"> Wear leather, cotton or other work gloves Be alert for hand injuries. Do not use your hand as the tool. Use the right tool for the job. Be aware of hand placement – do not place hands in front of machine guards.
	Falling	<ul style="list-style-type: none"> Always look where you are stepping Have a spotter watch as you are moving the saw to the lift gate.
Operation	Electrical Shock	<ul style="list-style-type: none"> Follow manufacturer's instructions Use proper switching for start ups and shut downs



JSA

JOB SAFETY ANALYSIS

For RM Department Use
JSA NO:
Primary Job Category:

DESCRIPTION OF JOB: Portable Generator – Gasoline Powered

REVISION DATE:

JSA CREATED ON: 26Jan09

PREPARED BY: C. Candela

REVIEWED BY: D. Reinbold

APPROVED BY: D. Reinbold

PAGE: 2 of 2

MINIMUM REQUIRED PERSONAL PROTECTIVE EQUIPMENT

- | | | | |
|-------------------------------------------------------|--------------------------------------------------------------------------|-------------------------------------------------------|------------------------------------------------|
| <input type="checkbox"/> REFLECTIVE VEST | <input checked="" type="checkbox"/> LONG PANTS | <input type="checkbox"/> AIR PURIFYING RESPIRATOR | <input type="checkbox"/> OTHER: Chainsaw Chaps |
| <input type="checkbox"/> HARD HAT | <input checked="" type="checkbox"/> COTTON, LEATHER, OR CRAFTSMAN GLOVES | <input type="checkbox"/> SUPPLIED AIR RESPIRATOR | <input type="checkbox"/> OTHER: |
| <input checked="" type="checkbox"/> SAFETY TOED BOOTS | <input type="checkbox"/> CHEMICAL RESISTANT GLOVE: | <input type="checkbox"/> CHEMICAL RESISTANT CLOTHING: | <input type="checkbox"/> OTHER: |
| <input checked="" type="checkbox"/> SAFETY GLASSES | <input type="checkbox"/> HEARING PROTECTION | <input type="checkbox"/> GOGGLES | <input type="checkbox"/> OTHER: |
| <input type="checkbox"/> FACE SHIELD | | | <input type="checkbox"/> OTHER: |

REQUIRED TOOLS/EQUIPMENT/SUPPLIES

- | | | | |
|--------------------------------------------------|-----------------------------------------------------------------|---------------------------------|---------------------------------|
| <input type="checkbox"/> DRINKING WATER | <input type="checkbox"/> RATCHET WITH EXTENSION | <input type="checkbox"/> OTHER: | <input type="checkbox"/> OTHER: |
| <input type="checkbox"/> BUG REPELLENT | <input type="checkbox"/> WELL MAGNET | <input type="checkbox"/> OTHER: | <input type="checkbox"/> OTHER: |
| <input type="checkbox"/> TRAFFIC CONTROL DEVICES | <input type="checkbox"/> AIR MONITORING SELECT FROM LIST | <input type="checkbox"/> OTHER: | <input type="checkbox"/> OTHER: |
| <input type="checkbox"/> LADDER | <input type="checkbox"/> LOCKOUT/TAGOUT EQUIPMENT | <input type="checkbox"/> OTHER: | <input type="checkbox"/> OTHER: |

1
JOB STEPS

2
POTENTIAL HAZARDOUS CONDITIONS or
UNSAFE PRACTICES

3
SAFE PROCEDURES and PREVENTATIVE MEASURES

- Use GFI adapter and/or cord



JSA

JOB SAFETY ANALYSIS

For RM Department Use
JSA NO:
Primary Job Category:

DESCRIPTION OF JOB: Mobilize to and from site

REVISION DATE:

JSA CREATED ON: 26Jan09

PREPARED BY: C. Candela

REVIEWED BY: D. Reinbold

APPROVED BY: D. Reinbold

PAGE: 1 of 3

MINIMUM REQUIRED PERSONAL PROTECTIVE EQUIPMENT

<input checked="" type="checkbox"/> REFLECTIVE VEST <input type="checkbox"/> HARD HAT <input type="checkbox"/> SAFETY TOED BOOTS <input type="checkbox"/> SAFETY GLASSES <input type="checkbox"/> FACE SHIELD	<input type="checkbox"/> LONG PANTS <input type="checkbox"/> COTTON, LEATHER, OR CRAFTSMAN GLOVES <input type="checkbox"/> CHEMICAL RESISTANT GLOVE: <input type="checkbox"/> HEARING PROTECTION	<input type="checkbox"/> AIR PURIFYING RESPIRATOR <input type="checkbox"/> SUPPLIED AIR RESPIRATOR <input type="checkbox"/> CHEMICAL RESISTANT CLOTHING: <input type="checkbox"/> GOGGLES	<input type="checkbox"/> OTHER: <input type="checkbox"/> OTHER: <input type="checkbox"/> OTHER: <input type="checkbox"/> OTHER: <input type="checkbox"/> OTHER:
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REQUIRED TOOLS/EQUIPMENT/SUPPLIES

<input type="checkbox"/> DRINKING WATER <input type="checkbox"/> BUG REPELLENT <input checked="" type="checkbox"/> TRAFFIC CONTROL DEVICES <input type="checkbox"/> LADDER	<input type="checkbox"/> RATCHET WITH EXTENSION <input type="checkbox"/> WELL MAGNET <input type="checkbox"/> AIR MONITORING SELECT FROM LIST <input type="checkbox"/> LOCKOUT/TAGOUT EQUIPMENT	<input type="checkbox"/> OTHER: <input type="checkbox"/> OTHER: <input type="checkbox"/> OTHER: <input type="checkbox"/> OTHER:	<input type="checkbox"/> OTHER: <input type="checkbox"/> OTHER: <input type="checkbox"/> OTHER: <input type="checkbox"/> OTHER:
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1 JOB STEPS	2 POTENTIAL HAZARDOUS CONDITIONS or UNSAFE PRACTICES	3 SAFE PROCEDURES and PREVENTATIVE MEASURES
Enter/Exit Vehicle	Hand injuries – cuts and pinches	<ul style="list-style-type: none">• Make sure keys are in your pocket before shutting door• Only lock the vehicle once the door is closed.• Do not try to stop the door• Do not place your hand between the door and the frame of the vehicle.
	Crime/Assault	<ul style="list-style-type: none">• Beware of surroundings.• Use buddy system if working in high crime areas or at night.• Ask for someone to walk to your vehicle with you.
Driving to and from site	Vehicles	<ul style="list-style-type: none">• Use defensive driving techniques.
	Pedestrians	<ul style="list-style-type: none">• Yield to all pedestrians.• Use defensive driving techniques.
	Trains	<ul style="list-style-type: none">• Yield to all trains• Do not try to race trains• When crossing unguarded tracks slow down and check for the presence of a train before crossing.
	Road Conditions	<ul style="list-style-type: none">• Use caution while traveling in construction zones• Follow ATC's Winter Driving Tips
		<ul style="list-style-type: none">•
		<ul style="list-style-type: none">•

3 SAFE PROCEDURES and PREVENTATIVE MEASURES



JSA

JOB SAFETY ANALYSIS

For RM Department Use
JSA NO:
Primary Job Category:

DESCRIPTION OF JOB: Mobilize to and from site

REVISION DATE:

JSA CREATED ON: 26Jan09

PREPARED BY: C. Candela

REVIEWED BY: D. Reinbold

APPROVED BY: D. Reinbold

PAGE: 3 of 3

MINIMUM REQUIRED PERSONAL PROTECTIVE EQUIPMENT

<input checked="" type="checkbox"/> REFLECTIVE VEST	<input type="checkbox"/> LONG PANTS	<input type="checkbox"/> AIR PURIFYING RESPIRATOR	<input type="checkbox"/> OTHER:
<input type="checkbox"/> HARD HAT	<input type="checkbox"/> COTTON, LEATHER, OR CRAFTSMAN GLOVES	<input type="checkbox"/> SUPPLIED AIR RESPIRATOR	<input type="checkbox"/> OTHER:
<input type="checkbox"/> SAFETY TOED BOOTS	<input type="checkbox"/> CHEMICAL RESISTANT GLOVE:	<input type="checkbox"/> CHEMICAL RESISTANT CLOTHING:	<input type="checkbox"/> OTHER:
<input type="checkbox"/> SAFETY GLASSES	<input type="checkbox"/> HEARING PROTECTION	<input type="checkbox"/> GOGGLES	<input type="checkbox"/> OTHER:
<input type="checkbox"/> FACE SHIELD			

REQUIRED TOOLS/EQUIPMENT/SUPPLIES

<input type="checkbox"/> DRINKING WATER	<input type="checkbox"/> RATCHET WITH EXTENSION	<input type="checkbox"/> OTHER:	<input type="checkbox"/> OTHER:
<input type="checkbox"/> BUG REPELLENT	<input type="checkbox"/> WELL MAGNET	<input type="checkbox"/> OTHER:	<input type="checkbox"/> OTHER:
<input checked="" type="checkbox"/> TRAFFIC CONTROL DEVICES	<input type="checkbox"/> AIR MONITORING SELECT FROM LIST	<input type="checkbox"/> OTHER:	<input type="checkbox"/> OTHER:
<input type="checkbox"/> LADDER	<input type="checkbox"/> LOCKOUT/TAGOUT EQUIPMENT	<input type="checkbox"/> OTHER:	<input type="checkbox"/> OTHER:

1
JOB STEPS

2
POTENTIAL HAZARDOUS CONDITIONS or
UNSAFE PRACTICES

3
SAFE PROCEDURES and PREVENTATIVE MEASURES

•



JSA

JOB SAFETY ANALYSIS

For RM Department Use
JSA NO:
Primary Job Category:

DESCRIPTION OF JOB: Hand Held Portable Power Tools		REVISION DATE:	JSA CREATED ON: 26Jan09
PREPARED BY: C. Candela	REVIEWED BY: D. Reinbold	APPROVED BY: D. Reinbold	PAGE: 1 of 4

MINIMUM REQUIRED PERSONAL PROTECTIVE EQUIPMENT

<input checked="" type="checkbox"/> REFLECTIVE VEST	<input checked="" type="checkbox"/> LONG PANTS	<input type="checkbox"/> AIR PURIFYING RESPIRATOR	<input type="checkbox"/> OTHER:
<input checked="" type="checkbox"/> HARD HAT	<input checked="" type="checkbox"/> COTTON, LEATHER, OR CRAFTSMAN GLOVES	<input type="checkbox"/> SUPPLIED AIR RESPIRATOR	<input type="checkbox"/> OTHER:
<input checked="" type="checkbox"/> SAFETY TOED BOOTS	<input type="checkbox"/> CHEMICAL RESISTANT GLOVE:	<input type="checkbox"/> CHEMICAL RESISTANT CLOTHING:	<input type="checkbox"/> OTHER:
<input checked="" type="checkbox"/> SAFETY GLASSES	<input checked="" type="checkbox"/> HEARING PROTECTION	<input type="checkbox"/> GOGGLES	<input type="checkbox"/> OTHER:
<input type="checkbox"/> FACE SHIELD			

REQUIRED TOOLS/EQUIPMENT/SUPPLIES

<input type="checkbox"/> DRINKING WATER	<input type="checkbox"/> RATCHET WITH EXTENSION	<input type="checkbox"/> OTHER:	<input type="checkbox"/> OTHER:
<input type="checkbox"/> BUG REPELLENT	<input type="checkbox"/> WELL MAGNET	<input type="checkbox"/> OTHER:	<input type="checkbox"/> OTHER:
<input type="checkbox"/> TRAFFIC CONTROL DEVICES	<input type="checkbox"/> AIR MONITORING SELECT FROM LIST	<input type="checkbox"/> OTHER:	<input type="checkbox"/> OTHER:
<input type="checkbox"/> LADDER	<input type="checkbox"/> LOCKOUT/TAGOUT EQUIPMENT	<input type="checkbox"/> OTHER:	<input type="checkbox"/> OTHER:

1 JOB STEPS	2 POTENTIAL HAZARDOUS CONDITIONS or UNSAFE PRACTICES	3 SAFE PROCEDURES and PREVENTATIVE MEASURES
Pickup/Set down supplies/tools	Back injuries Cuts to the hands Slips, trips and falls	<ul style="list-style-type: none"> Wear leather work gloves. Follow proper lifting procedures – lift with your legs. Do not lift more than 50 pounds without assistance. Watch hand placement. Take your time – slow down. Check object for sharp edges.
Carry supplies/tools	Back injuries Hand injuries Slips, trips and falls	<ul style="list-style-type: none"> Wear leather work gloves. Follow proper lifting procedures – lift with your legs. Do not lift more than 50 pounds without assistance. Watch hand placement. Clear a pathway before lifting and carrying any supplies or tools.
Attach and Remove Attachments	Hand and Arm Cuts	<ul style="list-style-type: none"> Wear leather, cotton or other work gloves Be alert for hand injuries. Do not use your hand as the tool. Use the right tool for the job. Be aware of hand placement – do not place hands in the path of hammers, knives or between objects.
Cut Asphalt or Concrete	Back Injuries	<ul style="list-style-type: none"> Use proper lifting procedures – avoid lifting with the back and twisting. If over 50 pounds or awkward ask for assistance.
	Slips, Trips, Falls	<ul style="list-style-type: none"> Maintain housekeeping. Set up work zone with enough room for staging of equipment and supplies such that there are aisle ways for walking and working. If on pavement or concrete sweep up loose sand, dirt or rock



JSA

JOB SAFETY ANALYSIS

For RM Department Use
JSA NO:
Primary Job Category:

DESCRIPTION OF JOB: Hand Held Portable Power Tools		REVISION DATE:	JSA CREATED ON: 26Jan09
PREPARED BY: C. Candela	REVIEWED BY: D. Reinbold	APPROVED BY: D. Reinbold	PAGE: 2 of 4

MINIMUM REQUIRED PERSONAL PROTECTIVE EQUIPMENT			
<input checked="" type="checkbox"/> REFLECTIVE VEST	<input checked="" type="checkbox"/> LONG PANTS	<input type="checkbox"/> AIR PURIFYING RESPIRATOR	<input type="checkbox"/> OTHER:
<input checked="" type="checkbox"/> HARD HAT	<input checked="" type="checkbox"/> COTTON, LEATHER, OR CRAFTSMAN GLOVES	<input type="checkbox"/> SUPPLIED AIR RESPIRATOR	<input type="checkbox"/> OTHER:
<input checked="" type="checkbox"/> SAFETY TOED BOOTS	<input type="checkbox"/> CHEMICAL RESISTANT GLOVE:	<input type="checkbox"/> CHEMICAL RESISTANT CLOTHING:	<input type="checkbox"/> OTHER:
<input checked="" type="checkbox"/> SAFETY GLASSES	<input checked="" type="checkbox"/> HEARING PROTECTION	<input type="checkbox"/> GOGGLES	<input type="checkbox"/> OTHER:
<input type="checkbox"/> FACE SHIELD			

REQUIRED TOOLS/EQUIPMENT/SUPPLIES			
<input type="checkbox"/> DRINKING WATER	<input type="checkbox"/> RATCHET WITH EXTENSION	<input type="checkbox"/> OTHER:	<input type="checkbox"/> OTHER:
<input type="checkbox"/> BUG REPELLENT	<input type="checkbox"/> WELL MAGNET	<input type="checkbox"/> OTHER:	<input type="checkbox"/> OTHER:
<input type="checkbox"/> TRAFFIC CONTROL DEVICES	<input type="checkbox"/> AIR MONITORING SELECT FROM LIST	<input type="checkbox"/> OTHER:	<input type="checkbox"/> OTHER:
<input type="checkbox"/> LADDER	<input type="checkbox"/> LOCKOUT/TAGOUT EQUIPMENT	<input type="checkbox"/> OTHER:	<input type="checkbox"/> OTHER:

1 JOB STEPS	2 POTENTIAL HAZARDOUS CONDITIONS or UNSAFE PRACTICES	3 SAFE PROCEDURES and PREVENTATIVE MEASURES
		<ul style="list-style-type: none"> Wear slip resistant steel toed boots. Keep foot wear clean of mud and other debris. Vacuum up water as quickly as possible.
	Noise	<ul style="list-style-type: none"> Wear hearing protection. Place hearing protection warning signs on the work zone barrier at intervals of 20 feet. Review hand signals during tailgate meeting.
	Dust	<ul style="list-style-type: none"> Use water.
	Flying Debris	<ul style="list-style-type: none"> Use water.
	Hand Cuts	<ul style="list-style-type: none"> Wear leather, cotton or other work gloves Be alert for hand injuries. Do not use your hand as the tool. Use the right tool for the job. Be aware of hand placement – do not place hands in the path of hammers, knives or between objects.
	Weather	<ul style="list-style-type: none"> Prevent heat and cold illnesses by: drinking water frequently and moderately; rest frequently; wear light colored clothing; eat light meals. Adjust work schedule to avoid temperature extremes. Sunscreen Layer clothing to adjust to changing environmental temperatures Avoid drinks with caffeine (coffee, tea, or soda) or alcohol.



JSA

JOB SAFETY ANALYSIS

For RM Department Use
JSA NO:
Primary Job Category:

DESCRIPTION OF JOB: Hand Held Portable Power Tools

REVISION DATE:

JSA CREATED ON: 26Jan09

PREPARED BY: C. Candela

REVIEWED BY: D. Reinbold

APPROVED BY: D. Reinbold

PAGE: 3 of 4

MINIMUM REQUIRED PERSONAL PROTECTIVE EQUIPMENT

- | | | | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input checked="" type="checkbox"/> REFLECTIVE VEST
<input checked="" type="checkbox"/> HARD HAT
<input checked="" type="checkbox"/> SAFETY TOED BOOTS
<input checked="" type="checkbox"/> SAFETY GLASSES
<input type="checkbox"/> FACE SHIELD | <input checked="" type="checkbox"/> LONG PANTS
<input checked="" type="checkbox"/> COTTON, LEATHER, OR CRAFTSMAN GLOVES
<input type="checkbox"/> CHEMICAL RESISTANT GLOVE:
<input checked="" type="checkbox"/> HEARING PROTECTION | <input type="checkbox"/> AIR PURIFYING RESPIRATOR
<input type="checkbox"/> SUPPLIED AIR RESPIRATOR
<input type="checkbox"/> CHEMICAL RESISTANT CLOTHING:
<input type="checkbox"/> GOGGLES | <input type="checkbox"/> OTHER:
<input type="checkbox"/> OTHER:
<input type="checkbox"/> OTHER:
<input type="checkbox"/> OTHER:
<input type="checkbox"/> OTHER: |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

REQUIRED TOOLS/EQUIPMENT/SUPPLIES

- | | | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/> DRINKING WATER
<input type="checkbox"/> BUG REPELLENT
<input type="checkbox"/> TRAFFIC CONTROL DEVICES
<input type="checkbox"/> LADDER | <input type="checkbox"/> RATCHET WITH EXTENSION
<input type="checkbox"/> WELL MAGNET
<input type="checkbox"/> AIR MONITORING SELECT FROM LIST
<input type="checkbox"/> LOCKOUT/TAGOUT EQUIPMENT | <input type="checkbox"/> OTHER:
<input type="checkbox"/> OTHER:
<input type="checkbox"/> OTHER:
<input type="checkbox"/> OTHER: | <input type="checkbox"/> OTHER:
<input type="checkbox"/> OTHER:
<input type="checkbox"/> OTHER:
<input type="checkbox"/> OTHER: |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|

1 JOB STEPS	2 POTENTIAL HAZARDOUS CONDITIONS or UNSAFE PRACTICES	3 SAFE PROCEDURES and PREVENTATIVE MEASURES
		<ul style="list-style-type: none">• Use the buddy system (work in pairs).
	Vehicles	<ul style="list-style-type: none">• Use barrier controls with a height of at least 36 inches.• Wear traffic reflective vest.
	Pedestrians	<ul style="list-style-type: none">• Use barrier controls with a height of at least 36 inches• Place signs indicating authorized personnel only at intervals of 20 feet.<ul style="list-style-type: none">• Caution tape or snow fence should be used to surround the entire site.
		<ul style="list-style-type: none">•
		<ul style="list-style-type: none">•
		<ul style="list-style-type: none">•
		<ul style="list-style-type: none">•
		<ul style="list-style-type: none">•



JSA

JOB SAFETY ANALYSIS

For RM Department Use
JSA NO:
Primary Job Category:

DESCRIPTION OF JOB: Hand Held Portable Power Tools

REVISION DATE:

JSA CREATED ON: 26Jan09

PREPARED BY: C. Candela

REVIEWED BY: D. Reinbold

APPROVED BY: D. Reinbold

PAGE: 4 of 4

MINIMUM REQUIRED PERSONAL PROTECTIVE EQUIPMENT

- ☒ REFLECTIVE VEST
- ☒ HARD HAT
- ☒ SAFETY TOED BOOTS
- ☒ SAFETY GLASSES
- ☐ FACE SHIELD

- ☒ LONG PANTS
- ☒ COTTON, LEATHER, OR CRAFTSMAN GLOVES
- ☐ CHEMICAL RESISTANT GLOVE:
- ☒ HEARING PROTECTION

- ☐ AIR PURIFYING RESPIRATOR
- ☐ SUPPLIED AIR RESPIRATOR
- ☐ CHEMICAL RESISTANT CLOTHING:
- ☐ GOGGLES

- ☐ OTHER:
- ☐ OTHER:
- ☐ OTHER:
- ☐ OTHER:
- ☐ OTHER:

REQUIRED TOOLS/EQUIPMENT/SUPPLIES

- ☐ DRINKING WATER
- ☐ BUG REPELLENT
- ☐ TRAFFIC CONTROL DEVICES
- ☐ LADDER

- ☐ RATCHET WITH EXTENSION
- ☐ WELL MAGNET
- ☐ AIR MONITORING **SELECT FROM LIST**
- ☐ LOCKOUT/TAGOUT EQUIPMENT

- ☐ OTHER:
- ☐ OTHER:
- ☐ OTHER:
- ☐ OTHER:

- ☐ OTHER:
- ☐ OTHER:
- ☐ OTHER:
- ☐ OTHER:

1 JOB STEPS	2 POTENTIAL HAZARDOUS CONDITIONS or UNSAFE PRACTICES	3 SAFE PROCEDURES and PREVENTATIVE MEASURES
		•
		•
		•
		•



JSA

JOB SAFETY ANALYSIS

For RM Department Use
JSA NO:
Primary Job Category:

DESCRIPTION OF JOB: Unloading Miscellaneous Tools / Supplies

REVISION DATE:

JSA CREATED ON: 26Jan09

PREPARED BY: C. Candela

REVIEWED BY: D. Reinbold

APPROVED BY: D. Reinbold

PAGE: 1 of 1

MINIMUM REQUIRED PERSONAL PROTECTIVE EQUIPMENT

- | | | | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input checked="" type="checkbox"/> REFLECTIVE VEST
<input checked="" type="checkbox"/> HARD HAT
<input checked="" type="checkbox"/> SAFETY TOED BOOTS
<input checked="" type="checkbox"/> SAFETY GLASSES
<input type="checkbox"/> FACE SHIELD | <input checked="" type="checkbox"/> LONG PANTS
<input checked="" type="checkbox"/> COTTON, LEATHER, OR CRAFTSMAN GLOVES
<input type="checkbox"/> CHEMICAL RESISTANT GLOVE:
<input type="checkbox"/> HEARING PROTECTION | <input type="checkbox"/> AIR PURIFYING RESPIRATOR
<input type="checkbox"/> SUPPLIED AIR RESPIRATOR
<input type="checkbox"/> CHEMICAL RESISTANT CLOTHING:
<input type="checkbox"/> GOGGLES | <input type="checkbox"/> OTHER:
<input type="checkbox"/> OTHER:
<input type="checkbox"/> OTHER:
<input type="checkbox"/> OTHER:
<input type="checkbox"/> OTHER: |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

REQUIRED TOOLS/EQUIPMENT/SUPPLIES

- | | | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/> DRINKING WATER
<input type="checkbox"/> BUG REPELLENT
<input checked="" type="checkbox"/> TRAFFIC CONTROL DEVICES
<input type="checkbox"/> LADDER | <input type="checkbox"/> RATCHET WITH EXTENSION
<input type="checkbox"/> WELL MAGNET
<input type="checkbox"/> AIR MONITORING SELECT FROM LIST
<input type="checkbox"/> LOCKOUT/TAGOUT EQUIPMENT | <input type="checkbox"/> OTHER:
<input type="checkbox"/> OTHER:
<input type="checkbox"/> OTHER:
<input type="checkbox"/> OTHER: | <input type="checkbox"/> OTHER:
<input type="checkbox"/> OTHER:
<input type="checkbox"/> OTHER:
<input type="checkbox"/> OTHER: |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|

1 JOB STEPS	2 POTENTIAL HAZARDOUS CONDITIONS or UNSAFE PRACTICES	3 SAFE PROCEDURES and PREVENTATIVE MEASURES
Pickup/Set down supplies/tools	Back injuries Cuts to the hands Slips, trips and falls	<ul style="list-style-type: none">Wear leather work gloves.Follow proper lifting procedures – lift with your legs. Do not lift more than 50 pounds without assistance.Watch hand placement.Take your time – slow down.Check object for sharp edges.
Carry supplies/tools	Back injuries Hand injuries Slips, trips and falls	<ul style="list-style-type: none">Wear leather work gloves.Follow proper lifting procedures – lift with your legs. Do not lift more than 50 pounds without assistance.Watch hand placement.Clear a pathway before lifting and carrying any supplies or tools.Always look where you are stepping

Appendix B

Tailgate Safety Meeting Forms

**ATC Project Number:**

Work Being Performed:

Date & Time of Meeting:

Name of Presenter:

Itemize the Specific Topics Discussed (if more space is needed use the back of this page):


- Participants (if needed, list additional participants on back of this page):**

[illegible]

Rev. 03; Revision Date: 02-28-2008

Appendix C

Applicable ATC Health and Safety Policies

	Employee Health & Safety Policy Manual	Policy Section #:	35
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		Issue Date:	05/07/2007

1.0 Policy

ATC employees who work at sites covered by OSHA's Hazardous Waste Operations and Emergency Response (HAZWOPER) regulations 29 CFR 1910.120 shall be properly trained, supervised and directed to follow the requirements outlined in this policy.

This policy covers minimum performance standards applicable to all ATC Associates employees and locations. Local practices requiring more detailed or stringent rules or local, state or other federal requirements regarding this subject can and should be added as an addendum to this procedure as applicable.

2.0 Purpose

To ensure that the risk of personnel injury, environmental impact, and property damage are controlled and/or minimized at sites where hazardous substances are present in soil, air or groundwater.

3.0 Scope

Applies to ATC worksites that are covered by OSHA HAZWOPER regulations for site operations and/or emergency response.

4.0 Definitions


See the OSHA HAZWOPER Standard, 29 CFR 1910.120(a)(3), for definitions.

5.0 Requirements

5.1 General Requirements

5.1.1 Training

All applicable ATC employees must successfully complete the Hazwoper 40-hour comprehensive health and safety course and receive a site-specific orientation of the project based on the completion of the Environmental Health and Safety Plan before participating in hazardous waste site field activities. Such field activities include, but are not limited to, underground storage tank investigation and remediation, environmental site assessments involving potential exposure to hazardous situations or chemicals, and any other projects involving hazardous chemical sampling or remediation.

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In addition to the 40-hour classroom instruction, ATC employees shall receive a minimum of three days of practical field experience under the direct supervision of a trained, experienced supervisor. Each remote HAZWOPER project site shall have at least one individual currently certified in First Aid and CPR. Refer to Policy No. 20, First-Aid for specific requirements.

At least annually thereafter, each applicable ATC employee is then required to participate in an 8-hour refresher Hazwoper course that provides an overview of material presented in the 40-hour course. Supervisory personnel must participate in an additional 8-hour supervisor's health and safety course, which emphasizes safety management and more in-depth evaluation of health and safety procedures.

Refer to Policy No. 07, Safety Systems/Health and Safety Plans, for specific training and documentation requirements.

All training required by this policy shall be conducted by personnel whom have satisfactorily completed a training course for teaching the subjects they are expected to teach or have the training and/or academic credentials and instructional experience necessary to demonstrate competent instructional skills and a good command of the subject.


5.1.2 Health and Safety Plan

Prior to work commencing on worksites covered by Hazwoper regulations, or other worksites described in this section, a Health and Safety Plan shall be completed, submitted for review and approval and employees designated to work on the site will review the Plan.

This includes, but is not limited to projects such as: underground storage tank investigation and remediation, environmental site assessments involving potential exposure to hazardous situations or chemicals, and any other projects involving hazardous chemical sampling or remediation.

For these types of projects, ATC employees are directed to complete the (Level 3) Environmental Health and Safety Plan (see Policy NO. 07, Safety Systems/Health and Safety Plans). The Branch Safety Officer shall review Environmental Health and Safety Plans unless prior approval from the Regional Safety Coordinator or Corporate Safety Manager is obtained.

Plans that require review and approval (i.e., Level 2 or 3) must be provided to the reviewer no fewer than three (3) working days in advance of

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mobilization. If expedited approval is required, the HASP preparer must make special arrangements with the reviewer, in advance of submitting the plan for approval. Refer to Policy No. 07, Safety Systems/Health and Safety Plans for specific requirements.

5.1.3 Environmental Monitoring

In an effort to assess potential employee exposure, determine appropriate levels of personal protective equipment (PPE), and establish specific work zones, ATC will perform environmental monitoring at hazardous waste sites and in other hazardous situations such as during confined space entry. The type and degree of environmental monitoring will depend on the specific work activities and the known and suspected hazard(s) present. A site-specific monitoring plan and establishment of required PPE will be developed as part of each Health and Safety Plan. Refer to Policy No. 23, Industrial Hygiene.

5.1.4 Medical Surveillance

Medical surveillance shall be provided at no cost to applicable ATC employees who may be exposed to health hazards for 30 days or more a year or wear a respirator 30 or more days a year. The medical surveillance program shall also cover employees who are injured or develop symptoms due to exposure to hazards and any members of ATC HAZMAT teams. Refer to Policy No. 42, Medical Surveillance.


5.2 Site Control

To minimize the transfer of hazardous materials from a contaminated site to uncontaminated areas, ATC will establish site work zones and will institute strict decontamination procedures. Specific decontamination procedures are outlined in section 5.3 of this policy.

5.2.1 Work Zones

An essential measure toward reducing the migration of contaminants is to delineate the site into three specific work zones (see Figure 5.8.1). Movement of personnel and equipment must be through designated access control points. Personnel entering the site must first review the Health and Safety Plan and must sign in.

5.2.1.1 Exclusion Zone

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The Exclusion Zone, the innermost of the three zones, shall be established in the area where contamination does or could exist. The outer-most boundary of the Exclusion Zone is the Hotline. Any ATC personnel, subcontractors, or site visitors who cross over the Hotline and into the Exclusion Zone must wear necessary protective equipment as prescribed in the Health and Safety Plan. The Hotline must be made visually identifiable with fencing, traffic cones, traffic barricades, etc.

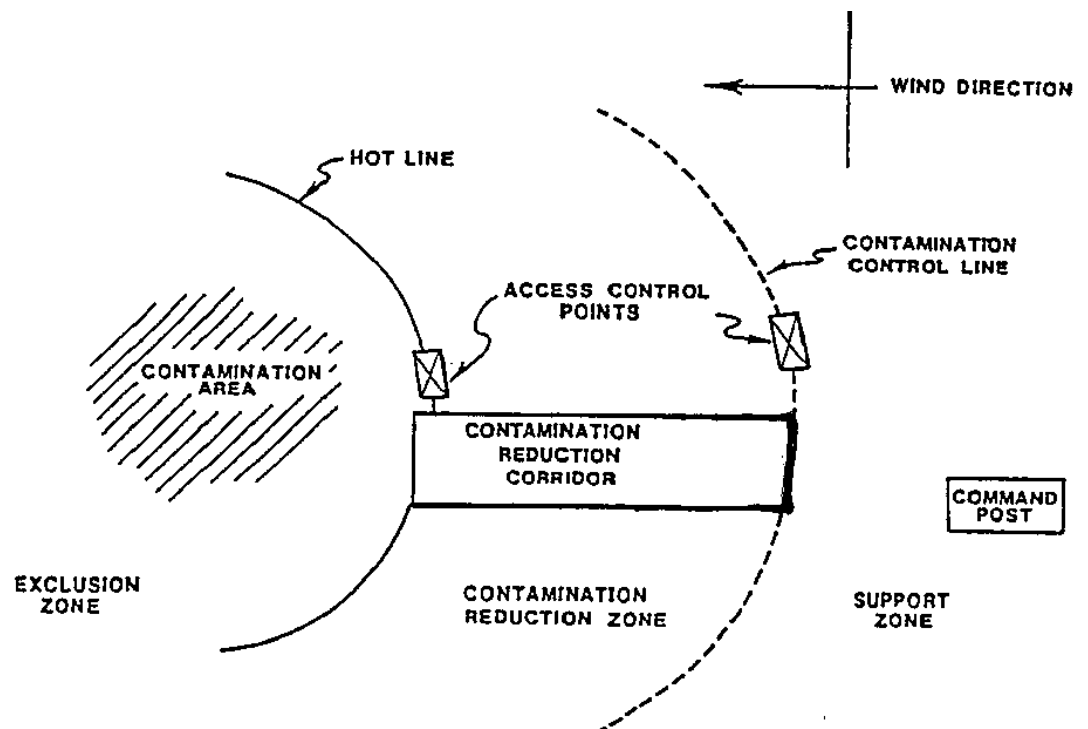
5.2.1.2 Support Zone


The Support Zone, the outermost zone on the work site, shall be established in the non-contaminated or clean area. Support equipment (office trailer, laboratory trailer, etc.) is designated for this area. Contaminated personnel, equipment, or samples are not permitted within this zone. Personnel operating within the Support Zone are not required to wear special protective equipment.

5.2.1.3 Contamination Reduction Zone (CRZ)

The CRZ, the zone between the Exclusion Zone and Support Zone, serves as a transition buffer area to prevent the spread of contamination.

FIGURE 5.2.1 - DIAGRAM OF SITE WORK ZONES



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The Contamination Reduction Corridor (CRC), or decontamination line, is located within the CRZ. Exit from the Exclusion Zone must be through the CRC, where equipment and personnel undergo decontamination.

A CRC for heavy equipment decontamination may be designated separate from the personnel CRC. The area in and around the CRC may become contaminated, although to a lesser degree than the Exclusion Zone. For this reason, personnel entering the CRZ must wear protective equipment as specified in the Health and Safety Plan. No contamination shall extend beyond the Contamination Control Line, which separates the CRZ from the Support Zone.

5.2.2 Determining Work Zone Dimensions

Proper size and placement of each work zone must be determined in order to provide adequate distances to prevent the spread of contaminants, allow room to conduct operations, and to eliminate the possibility of injury due to explosion or fire. Work zone dimensions and boundaries shall be established based upon the following:

- 1) Physical and topographical features of the site
- 2) Weather conditions
- 3) Field/laboratory measurements of air contaminants and environmental samples
- 4) Potential for fire, explosion, and flying debris
- 5) Physical, chemical, toxicological, and other characteristics of the substances present
- 6) Cleanup activities required
- 7) Area needed to conduct operations
- 8) Decontamination procedures
- 9) Potential for exposure
- 10) Proximity to residential or industrial areas

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5.2.3 Work Site Modifications

Once work zones have been established, changing conditions or scope of work may necessitate the modification of the work site. Work zones may be reduced or enlarged, shifted, or otherwise changed for any of the following reasons:


- 1) Wind direction shift
- 2) Monitoring and sampling reveals a more hazardous situation than originally thought
- 3) Monitoring and sampling reveals a less hazardous situation than originally thought
- 4) Monitoring and sampling indicates an abnormal spread of contamination into the CRZ
- 5) Monitoring and sampling reveals the spread of contamination into the Support Zone Work Zones

An essential measure toward reducing the migration of contaminants is to delineate the site into three specific work zones (see Figure 5.2.1). Movement of personnel and equipment must be through designated access control points. All personnel entering the site must first review the Health and Safety Plan and must sign in.

5.3 Decontamination

To prevent the transfer of hazardous materials into clean areas, ATC shall develop and implement site-specific contamination reduction and decontamination procedures. These procedures shall be in effect before anyone enters a contaminated site and shall continue throughout operations. The initial procedures may be modified as conditions dictate.

The initial decontamination plan is based on the premise that personnel and equipment leaving the Exclusion Area are grossly contaminated. Initial plans should require washing and rinsing all personnel, equipment, and other site dedicated equipment, where applicable, at least one time. Personnel decontamination should be completed by a combination of washing and rinsing and subsequent doffing of equipment, beginning with the most contaminated and

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ending with the least contaminated. Each piece of clothing or operation requires a separate station.

The initial decontamination plan may be modified by eliminating unnecessary stations or adapting to specific site conditions. This is especially true when disposable protective clothing is worn.

In preparing the initial decontamination plan, a worst-case situation should be assumed, which takes into consideration factors such as the type of contaminant, amount of contamination, levels of protection required, work function, location of contamination, and reason for leaving the site. The type of contaminant is the single most important factor for decontamination planning. Naturally, the more harmful the contaminant, the more extensive the decontamination should be.

The exact decontamination procedure is site-specific and determined by evaluating the previously mentioned factors for planning. Each decontamination plan must be outlined in the Health and Safety Plan.

Only authorized employees provided with the required training and certification will be allowed in the contamination and decontamination area. Suitable restrictions shall be put in place to assure only authorized access.


It is the responsibility of the Branch Manager, Project Manager, Branch Safety Officer or their competent designee to act as the site safety and health supervisor and monitor the site decontamination plan. If the site decontamination plan is found to be ineffective, the site safety and health supervisor shall oversee immediate correction of deficiencies identified.

5.3.1 Personal Decontamination

5.3.1.1 Decontamination Equipment

The following equipment is typical of the materials necessary for Level C or Level B decontamination:

- 1) Plastic drop cloth (10' X 25')
- 2) Two basins or wading pools (for wash and rinse)
- 3) Two pressurized garden sprayers (for application of wash and rinse)
- 4) Water
- 5) Decontamination solution

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- 6) Two long handled scrub brushes
- 7) Two 55 gallon drums with liners (for disposal of contaminated items)
- 8) Chairs, benches, or stools
- 9) Small bucket (to wash respirator facepieces)


When the decontamination plan indicates a need for regular showers and change rooms outside of the contaminated area, they shall be provided and meet the requirements of 29 CFR 1910.141. If temperature conditions prevent the effective use of water, then other effective means of cleansing shall be provided and used.

5.3.1.2 Decontamination Solutions

Usually, protective equipment is decontaminated by scrubbing with detergent water using a soft-bristle brush, followed by rinsing with copious amounts of water. Specific decontamination solutions may be required for more difficult decontamination problems. Table 5.3.1.2 illustrates several different decontamination solutions that may be utilized by ATC.

TABLE 5.3.1.2 - DECONTAMINATION SOLUTIONS

<u>Solution</u>	<u>Solution Description</u>	<u>Preparation</u>	<u>Type of Hazard</u>
A	A solution containing 5% sodium carbonate (Na_2CO_3) and 5% trisodium phosphate (Na_3PO_4)	To 10 gallons of water, add 4 pounds of sodium carbonate (Soda Ash) and 4 pounds of trisodium phosphate. Stir until evenly mixed.	Organic acids, metal processing wastes; and Heavy metals: mercury lead, cadmium, etc.
B	A solution containing 10% calcium hypochlorite ($\text{Ca}(\text{Cl})_2$)	To 10 gallons of water, add 8 pounds calcium hypochlorite. Stir with wooden or plastic stirrer until evenly mixed.	Pesticides, fungicides, and Cyanides, ammonia, and other non-acidic inorganic wastes
C	A solution containing 5% trisodium phosphate (Na_3PO_4). This solution can also be used as a general purpose rinse.	To 10 gallons of water, add 4 pounds of trisodium phosphate. Stir until evenly mixed.	Solvents and organic compounds such as trichloroethylene, chloroform, and toluene and PBBs and PCBs
D	A dilute solution of hydrochloric	To 10 gallons of water add	Strong Bases

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acid (HCL) and water, or commercially available base neutralizer.

1 teaspoon concentrated HCL, or for commercial product, follow package directions.

E	A dilute solution of phosphate free analytical quality detergent	To 10 gallons of water add 1 cup detergent.	Oils & most organics
---	------------------------------------------------------------------	---------------------------------------------	----------------------

5.3.1.3 Decontamination Protocol

Typically the personnel decontamination procedure starts with the most heavily contaminated areas of the body and proceeds to the least contaminated. The following outline illustrates the decontamination scenario used by personnel working in Level C protection.

As the worker leaves the Exclusion Zone, they approach the Hotline and proceeds to Decontamination Station 1.

-----HOTLINE-----

Station 1 (Segregated Equipment Drop)

- Deposit equipment used on site onto/into poly sheeting or poly lined containers. Place on table or pass to decon line personnel.

Station 2 (Total Outer Protective Clothing Wash)

- Scrub suits, boots, and gloves thoroughly with solution and soft bristle scrub brushes.

Station 3 (Total Outer Protective Clothing Rinse)


- Total rinse with large amounts of water. Repeat as necessary.

Station 4 (Tape Removal)

- Remove tape around boots, gloves, and facepieces and deposit in plastic-lined drum.

Station 5 (Outer Boot Removal)

- Remove boots and place in designated container for later thorough cleaning.

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Station 6 (Outer Glove Removal)

- Remove outer gloves and deposit in container with plastic liner.

Station 7 (Protective Coverall Removal)

- Remove outer protective coverall inside out and deposit it into a plastic lined drum. If wearing an inner coverall, keep it on.

Station 8 (Facepiece Removal)

- Remove respirator and place in designated container for complete sanitization.

Station 9 (Inner Glove Removal)

- Remove inner gloves inside out. Place in plastic lined drums.

-----CONTAMINATION CONTROL LINE-----

Station 10 (Shower and Locker Room)

- If a shower trailer is available, thoroughly shower with soap and water.


5.3.2 Emergency Decontamination

In the event of an on-site medical emergency, a decision must be made regarding decontamination if the injury occurs in an area of chemical contamination. There is a possibility that decontamination procedures may aggravate or cause more serious health effects.

For minor medical problems or injuries, the normal decontamination procedures should be followed.

If prompt life-saving first aid and medical treatment is required, decontamination procedures may have to be omitted. In such circumstances, the following guidelines should be used:

- 1) If possible, remove outer protective coveralls and clothing by cutting away if necessary.

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- 2) If the outer contaminated garments cannot be safely removed, the individual should be wrapped in plastic, blankets, etc. to prevent contaminating medical personnel and vehicles.
- 3) If possible, an ATC representative from the project site should accompany the contaminated victim to the medical facility to advise on matters involving decontamination.

5.3.3 Equipment Decontamination

5.3.3.1 Sampling and Monitoring Equipment

Delicate sampling and air monitoring equipment is very difficult to clean without damaging, once it has been contaminated. ATC personnel shall carefully wrap such instrumentation in plastic prior to entering the Exclusion Zone in such a manner that allows proper operation of the device.

5.3.3.2 Heavy Equipment


Bulldozers, trucks, back-hoes, etc. may require decontamination in certain circumstances. Such heavy equipment will be decontaminated utilizing a combination of high pressure water wash, and/or steam cleaning, and/or hand scrubbing with decontamination solution. Run-off from the area must be prevented using polyethylene plastic and/or a sump system. Wipe tests may be utilized to measure decontamination effectiveness.

5.3.3.3 Decontamination Modification

It is possible that changing conditions, changes in work scope, the discovery of additional hazardous materials, etc. may necessitate the alteration of the decontamination system being used on site. ATC personnel must always be prepared to adjust to such situations by maintaining extra decontamination equipment on site (i.e. brushes, basins, decon solutions, etc.). Modifications must be noted in the Health and Safety Plan.

5.3.3.4 Disposal of Contaminated Material

Materials and equipment used for decontamination must be disposed of properly. Non-disposable clothing (i.e., respirators, boots, gloves,

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etc.) must be completely decontaminated before removing from the site.

In many instances, disposable clothing will be utilized. This material must be secured in drums or other containers, properly labeled, and disposed of with other contaminated substances on site. In addition, tools, brushes, plastic, wash and rinse solutions, etc. which cannot be decontaminated must be secured in drums, labeled, and disposed of with other substances on site. Unauthorized employees shall not remove protective clothing or equipment from change rooms.

The disposal procedure for contaminated equipment and material generated during a project must be decided prior to the start of the project. Under no circumstances is contaminated soil, decontamination solution, equipment, etc. to be taken to any ATC office.

5.4 Emergency Response to Hazardous Substance Releases


ATC personnel do not routinely get involved in Emergency response operations, such as releases of hazardous substances where there is a potential safety or health hazard (i.e. fire, explosion, or chemical exposure). Incidental releases of hazardous substances where the substance can be absorbed, neutralized, and otherwise controlled at the time of the release are not considered emergency response. If true emergency response condition exists, ATC personnel will exit the area and notify emergency response personnel. If an ATC employee will be involved in emergency response operations, they will follow the requirements in this section.

5.4.1 Emergency Response Plan

ATC employees or subcontractors who are involved in Emergency Response Operations shall develop an Emergency Action Plan in accordance with 1910.120 and 29 CFR 1910.38. This plan will be incorporated into the site-specific Health and Safety Plan (HASP).

The Emergency Action Plan shall address, as a minimum, the following:

1. Pre-emergency planning and coordination with outside parties.
2. Personnel roles, lines of authority, training, and communication.
3. Emergency recognition and prevention.
4. Safe distances and places of refuge.
5. Site security and control.
6. Evacuation routes and procedures.
7. Decontamination.
8. Emergency medical treatment and first aid.

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9. Emergency alerting and response procedures.
10. Critique of response and follow-up.
11. PPE and emergency equipment.

The senior emergency response official responding to the emergency shall become the individual in charge of a site-specific Incident Command System. All site work and site communications should be through this "Incident Commander".

5.4.2 Training Requirements


All training shall be based on the duties and functions to be performed by the responder of an emergency response operation. All training given should be in accordance with 29 CFR 1910.120 (q)(6) and the National Fire Protection Association (NFPA) 472 Standard for Professional Competence of Responders to Hazardous Materials Incidents. All training course shall issue a certificate indicating that the employee is trained for their level of competency. Following is a summary of these training requirements:

5.4.2.1 First Responder Awareness Level

First responders at the awareness level are individuals who are likely to witness or discover a hazardous substance release and who have been trained to initiate an emergency response sequence by notifying the proper authorities. Awareness level responders have the ability to understand what hazardous substances are and the risks associated with them, understanding of the potential outcomes associated with the material, have the ability to identify the substance, and understand the Emergency action plan and the Department of Transportation (DOT) Emergency Response Guidebook.

5.4.2.2 First Responder Operations Level

First responders at the operational level are individuals who respond to releases or potential releases of hazardous substances for the purpose of protecting nearby persons, property, or the environment from the effects of the release. They are responsible for containing the release at a safe distance, keep it from spreading, and prevent exposures. Operation level employee's shall have at least 8 hours of training, including, the competencies at the first responder awareness level, and sufficient experience to demonstrate competency in basic hazard and risk assessment techniques, know how to select and use proper personal protective equipment (PPE), understand basic hazardous material terms,

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basic control, containment, and/or confinement operations, basic decontamination, and relevant Standard Operating Procedures (SOP).

5.4.2.3 Hazardous Materials Technician


A hazardous materials technician is an employee trained to respond to releases or potential releases for the purpose of stopping the release. Hazmat technicians shall have at least 24 hours of training and be trained in the competencies at the first responder operations level and knowing how to implement ATC's emergency response plan, know the classification, identification, and verification of known and unknown materials, know how to select the proper PPE and limitation to it, understand basic chemical and toxicological terminology and behavior, know how to collect and interpret hazard and response information, understand termination procedures, and know the function and elements of the Incident Command System.

5.4.2.4 Hazardous Materials Specialist

A hazardous materials specialist is an individual who respond with and provide support for the hazardous materials technician. The duties of the specialists parallel those of a Hazmat technician, but also include acting as a liaison for Federal, State, or Local government agencies. Hazardous materials specialist shall receive at least 24 hours of training equal to the technician level and have the know how to implement the local and state emergency response plan, know how to use advance survey instruments and equipment, be able to select and use specialized PPE, understand in-depth hazard and risk techniques, be able to determine and implement decontamination procedures, and have the ability to develop a site safety and control plan.

5.4.2.5 On-Scene Incident Commander

The incident commander is an individual whom will assume control of the incident scene beyond the first responder awareness level. The incident commander shall receive at least 24 hours of training equal to the first responder operations level and be able to implement the Incident Command System, know the employers and local emergency response plan, know the State emergency response plan of the Federal Regional Response Team, know and understand the importance of decontamination procedures.

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5.4.2.6 Refresher Training

Employees trained at any of the response levels stated above shall receive annual refresher training of sufficient content and duration to maintain their competencies, or shall demonstrate competency in those areas annually.

5.4.3 Trainer Qualifications

All training required by this section shall be conducted by personnel whom have satisfactorily completed a training course for teaching the subjects they are expected to teach, such as the courses offered by the U.S. National Fire Academy, or have the training and/or academic credentials and instructional experience necessary to demonstrate competent instructional skills and a good command of the subject.

5.4.4 Medical Surveillance


Medical Surveillance and consultation shall be in accordance with Policy No. 42, Medical Surveillance, and the established ATC Medical Surveillance Program.

5.4.5 Post-Emergency Response Operations

If after the completion of the emergency response activities ATC is contracted by the client to perform clean-up activities, the site will be clean-up following the requirements contained in 29 CFR 1910.120 (b) through (o) and Section 5.1 through 5.3 of this Policy. This includes removal of hazardous substances, health hazards, and materials contaminated with them (such as contaminated soil or other elements of the natural environment) from the site of the incident.

6.0 References

- Occupational Safety and Health Administration (OSHA) 29 CFR Part 1910.120.

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1.0 Policy

It is the responsibility of the Branch Safety Officer or designee to evaluate potential excessive noise exposures and to develop a facility or worksite specific plan(s) where necessary or warranted to assure that compliance to this Hearing Conservation Procedure is provided.

This policy covers minimum performance standards applicable to all ATC Associates employees and locations. Local practices requiring more detailed or stringent rules, or local, state or other federal requirements regarding this subject can and should be added as an addendum to this procedure as applicable.

2.0 Purpose

The purpose of this Hearing Conservation Procedure is to provide ATC Associates locations with a program to follow in case industrial noise exposure related to their operations create the potential for employee injury / illness and are identified in excess of OSHA action levels.

3.0 Scope

Applicable to ATC Associates work sites, i.e., ATC offices, clients job site, etc., when noise exposure reaches or exceeds an eight hour time weighted average (TWA) of eighty-five decibels, on an A scale (described as 85 dBA TWA). This measurement is known as the “action level”.

4.0 Definitions


Administrative Controls means reducing the time an employee is exposed, providing job rotation or improving education one wearing PPE.

Decibel or dB is the unit used to measure the intensity of a sound.

Engineering Controls means physically altering or changing a process such as adding a partition, insulating a wall or increasing the size of the bearings.

PPE means personal protective equipment

TWA means the Time Weighted Average.

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5.0 Requirements

5.1 General

This Hearing Conservation Procedure establishes guidelines for ATC Associates worksites to implement to minimize the effects of excessive noise exposure in the workplace and provide compliance to the related OSHA standards. Program implementation, according to federal standards, must occur when noise exposures reach or exceed an eight hour time weighted average (TWA) of eighty-five decibels, on an A scale (described as 85 dBA TWA). This measurement is known as the “action level”.


On the **decibel scale**, the smallest audible sound (near total silence) is 0 dB. A sound 10 times more powerful is 10 dB. A sound 100 times more powerful than near total silence is 20 dB. A sound 1,000 times more powerful than near total silence is 30 dB. Here are some common sounds and their decibel ratings:

- Near total silence - 0 dB
- Normal conversation - 60 dB
- A lawnmower - 90 dB
- A car horn - 110 dB
- A rock concert or a jet engine - 120 dB
- A gunshot or firecracker - 140 dB

Any sound above 85 dB can cause **hearing loss**, and the loss is related both to the power of the sound as well as the length of exposure. You know that you are listening to an 85-dB sound if you have to raise your voice to be heard by somebody else. Eight hours of 90-dB sound can cause damage to your ears; any exposure to 140-dB sound causes immediate damage (and causes actual pain).

This Hearing Conservation Procedure is applicable for any facility or worksite in which monitoring reveals a noise exposure at or above the action level. The following defines the specific action levels when implementation of a Hearing Conservation Program is required:

- An Eight (8) hour average exposures of 85 dBA or greater requires a comprehensive Hearing Conservation Program - training, audiograms, and availability of hearing protection.
- An Eight (8) hour average exposures of 90 dBA or greater requires

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mandatory use of hearing protection in addition to other Hearing Conservation Program requirements.

Once an action level is identified, measures shall be taken to reduce noise exposures through feasible administrative or engineering controls. If such controls fail, or are not feasible in reducing noise below the action level, personal protective equipment must be provided.

The Branch Safety Officer and/or Project Managers must ensure Hearing Protection is properly addressed on the PPE Hazard Assessment. Refer to Personal Protective Equipment section (25) for specific information. Hearing protection, audiometric testing and training will be provided at no cost to all applicable employees.

This procedure covers performance standards applicable to ATC Associates employees and locations. Local practices requiring more detailed or stringent rules, or local, state or other federal requirements regarding this subject can and should be added as an addendum to this procedure as applicable.

5.2 Engineering & Administrative Controls


Engineering controls are used to reduce noise output at the sources. This may include using insulation or enclosing cabs on open equipment. Administrative controls can be used in conjunction with PPE when engineering controls are not possible. These include:

- A. Employee training on the hearing conservation program, designating the use of hearing protection in required areas, methods to detect noise exposures, and the use of hearing protection.
- B. A "Hearing Protection Required" sign should be posted in high noise areas if hearing protection is required.
- C. Employees may be rotated to and from jobs during work shifts to reduce their daily average noise exposure.

In order for a Hearing Conservation Program to be effective it must be carried over into non-work hours that may expose employees to excessive noise such as loud music, firearms, chainsaws, etc.

5.3 Monitoring

When information indicates that employee exposures may equal or exceed action levels, the facility or worksite must implement a monitoring program.

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Sampling will identify employees who should be included in the Hearing Conservation Program and determine exposure levels for selecting appropriate hearing protection.

- A. Representative personnel sampling must be used unless area sampling produces equivalent results.
- B. Area or personnel monitoring must be performed by a person qualified to perform such monitoring using only properly calibrated equipment. The services of a certified industrial hygienist are recommended.
- C. Monitoring must be repeated whenever a change in the process or work practice increases noise exposures.
- D. Employees must be notified of monitoring results.

Refer to Industrial Hygiene section (23) for specific information on evaluating noise exposure.


5.4 Audiometric Testing Program

Audiometric testing must be made available to all employees whose exposures equals or exceeds the action level.

- A. New employees who will work in known noisy work areas are subject to an audiometric test during the pre-employment physical examination, to establish a baseline of hearing capability.
- B. Existing employees, whose eight-hour daily exposure to noise exceeds eighty-five decibels as measured with a dosimeter, must receive an audiogram on an annual basis, with the results compared back to the baseline and/or the previous audiogram to determine if any hearing loss occurred.

Note: When monitoring indicates employees are exposed to noise at or above 85 dBA, such employees must receive a baseline audiogram within six months of this determination.

- 1. Audiometric testing must be performed by an individual who is licensed, certified, or accredited to perform such tests. It is the Branch responsibility to arrange audiometric testing.
- 2. Audiometric tests must be provided at no cost to employees.

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3. Testing to establish a baseline audiogram shall be preceded by at least 14 hours with no exposure to workplace noise. If it is not possible to schedule the employee's work to achieve this objective, hearing protectors are an acceptable alternative, but must be strictly enforced.
4. The employee's immediate Supervisor must notify the employee of the need to avoid high levels of non-occupational noise during the 14-hour period preceeding any audiometric test.

C. Follow Up procedures include:

1. Notifying employees in writing, within 21 days, if annual results show a threshold shift from the baseline results.

Note: A standard threshold shift is a change in a person's hearing threshold relative to the baseline audiogram of an average 10dB or more at 2,000, 3,000, and 4,000 HZ in either ear.

2. If the threshold shift is determined to be work related, employees not using hearing protectors must be fitted and trained. Those already using protectors must be refitted and retrained.
3. If subsequent audiometric testing indicates a threshold shift did not exist, the employee should be informed of the new interpretation and be allowed to discontinue the required use of hearing protection if appropriate. The audiologist will normally review problem audiograms and determine the need for further evaluation.


5.4.1 Audiometric Testing Requirements

Medical clinics or service vendors for audiometric testing must provide written documentation with regard to their testing facility's certification as required by the OSHA standard.

5.4.2 Hearing Protectors

A. Hearing protectors may be implemented:

1. When it is impractical to institute administrative or engineering controls,
2. At the request of the employee.

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- B. The type of Hearing Protection selected should depend upon the employee's job duties. In no case should hearing protection interfere with an employee's ability to safely perform his/her job.
- C. Hearing protector attenuation requires that protectors reduce the specific noise environment to compliance levels. The Noise Reduction Rating (NRR) of any protector reduces the noise environment by the factor shown on its packaging. This means that a noise level of 105 would need a protector with at least a 21 NRR to be below the standard 85 decibel level. It is advisable to factor in an error rate of about 11 on most protectors.
- D. Employers are required to provide at least two (2) types of hearing protectors from which employees may choose.
- E. Employers are responsible for enforcing the use of hearing protectors if they are required under the Hearing Conservation Program. Employers must provide hearing protection to all employees exposed to 85 dBA or greater based on a time- weighted exposure of 8 hour. **Mandatory hearing protection is required for any employee exposed to noise at or above 90 dBA.**
- F. Employees must be trained in the use and care of hearing protectors.

5.5 Training

Each employee within the scope of this program must be trained initially and at least annually thereafter. The training must be updated to be consistent with changes in protective equipment and work processes.

Training shall be documented including the date of training, instructor's name, topics / materials covered and list of attendees. At a minimum, training shall include:

- A. The effects of noise on hearing;
- B. The different available types (plugs, muffs, etc.) and the purpose of hearing protectors, their advantages, disadvantages, and attenuation of noise levels;
- C. Instruction on selecting, fitting, using, and care of their hearing protection equipment;
- D. The purpose of audiometric testing and an explanation of the test procedure.

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This training must be documented in detail following the training session(s).

Provide each affected employee with a copy of the ATC Hearing Conservation Procedure - section (34); the applicable OSHA standard (29 CFR1910.95); and post a copy of the OSHA standard at the worksite.

5.6 Recordkeeping Requirements

The Branch Safety Officer shall retain Hearing Conservation Program records indefinitely. Medical Surveillance providers normally retain these records for a period of thirty (30) years post-employment.

A. Such records shall include:

1. Audiometric test records (see special notes)
2. Noise exposure monitoring


B. Audiometric test records shall include:

1. Employee's name and job classification;
2. Date of audiogram;
3. Name of examiner;
4. Date of last acoustic or exhaustive calibration of the audiometer;
5. Employee's recent noise assessment (audiogram).

C. Noise Exposure Monitoring records shall include:

1. Employee's name and job classification;
2. Equipment being operated and area of work;
3. Chronology of work/rest times throughout the day;
4. The hearing protection worn and its attenuation rating.

In addition, hearing loss or threshold shift of twenty five (25) decibels or more as a result of occupational noise exposure is considered an OSHA recordable injury, and must be listed on the Form 300 Log, in the year the hearing loss is diagnosed.

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5.7 Annual Program Review


The Branch Safety Officer shall conduct or supervise an annual review of the Hearing Conservation program. The review should address the following:

A. Monitoring:

1. Review previous monitoring results;
2. Identify areas with altered or changed equipment or processes and arrange for monitoring in these areas;
3. Arrange for monitoring in areas where monitoring has not been performed during the past year.
4. Audiometric testing;
5. Review audiometric results for all applicable employees;
6. Determine if repeat testing has been performed for employees who show a Standard Threshold Shift. If not, arrange for repeat testing;
7. Arrange for all employees working in areas where the noise level is above the action level to have the audiometric testing annually.

B. Review Hearing Loss Patterns:

1. Recognize jobs that seem to cause hearing loss;
2. Identify Potential Hearing Loss (PHL) cases;
3. Do employees wear their hearing protection?;
4. Do they wear hearing protection properly?;
5. Is the protection sufficient?;
6. Has noise increased in the work area?;
7. Was this increase caused by the addition of new equipment?;
8. Was this increase caused by old equipment becoming noisier?

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C. Implement Additional Controls:


1. Reduce noise sources with engineering controls; document noise abatement activity;
2. Obtain different hearing protectors;
3. Conduct additional training in the correct use of hearing protection;
4. Enforce the use of hearing protection where necessary.

Retrain and issue hearing protection with a higher protection level to any employee showing hearing loss. If these employees continue to show an occupationally related hearing loss over two consecutive years, job transfer without a noise hazard should be considered.

6.0 REFERENCES

OSHA 29CFR 1910.95

OSHA 29CFR 1926.52

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1.0 Policy

Subsurface work shall be conducted in a safe manner.

This policy covers minimum performance standards applicable to all ATC Associates employees and locations. Local practices requiring more detailed or stringent rules, or local, state or other federal requirements regarding this subject can and should be added as an addendum to this procedure as applicable.

2.0 Purpose

To define the procedures and standards applying to subsurface work as it relates to identifying and avoiding contact with buried utilities.

3.0 Scope

The following guidelines are geared to the petroleum industry but it is ATC's intent that the basic approach be applied to a wide variety of subsurface investigations.

4.0 Definitions

Air Knife is a method of drilling/boring that utilizes compressed air to avoid damage to buried utilities, pipes and tanks.

Critical Areas are any areas within 10 (ten) feet of the perimeter of the underground storage tank (UST) pit area and within 10 (ten) feet of the drip line of the dispenser/rack canopy, and all areas between the UST pit and the dispensers and between the dispenser/rack canopy and the store/office building.


Direct Push System is a hydraulically powered machine that uses both static force and percussion to advance soil sampling and logging tools into the subsurface without the use of drilling to remove soil or make a path for the tool.

Non-Critical Areas are defined as any area outside of a Critical Area.

One-Call Program is the term describing a federally required program that all states must implement as per the requirements of 49 CFR 198.37, allowing those engaged in subsurface work to be able to contact one telephone number to obtain assistance in identifying and locating buried utilities. (State one-call damage prevention program).

Subsurface work means any work involving excavations, trenching, drilling or boring.

UST means underground storage tank.

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Utility Markout is the identification and marking of underground utility lines.

5.0 Requirements

5.1 General

Safety is a top priority within ATC. Each of us must be committed to a safe workplace for our employees, subcontractors, clients and the general public. This is particularly true during field activities.

Because on-site drilling is one of our most potentially dangerous field activities, we have developed this series of subsurface investigation procedures to address key safety issues for drilling and boring operations. Note that some of our clients may have more stringent requirements that must be followed precisely.

If an employee or subcontractor fails to follow these procedures ATC may take disciplinary action, up to and including termination of employment, or for subcontractors, termination of our business relationship.

The most important steps for safe drilling are:


- If available, obtain the most recent as-built drawing for the site through the client's engineer.
- Use the local one-call system and information from client and on-site personnel to ensure that all known utilities are well marked.
- Hand dig, auger or use air knife to penetrate first five feet into soil, watching for lines as well as other indications of potential buried utilities, such as pea gravel.

Any boring or drilling planned within 10 feet of tank fields or pump islands must be discussed thoroughly with the ATC Project Manager, the Branch Manager and the Client Engineer prior to conducting this work. These are high-risk areas, so alternatives should be evaluated before electing to drill or bore.

5.2 Contractual Guidelines

The responsibilities and liabilities for Subsurface Investigations are established at the time when ATC contracts with the client for services, and when ATC contracts with any subcontractor that may be performing subsurface work on the project.

Prior to performing subsurface investigations, the project manager shall determine who will be contractually responsible for identifying and marking the location of underground utilities and man made obstructions.

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In most instances it is preferable that ATC not assume this responsibility. To determine who is contractually bound to assume this responsibility, the project manager must be familiar with the terms of all contract documents governing the work. Here are the key questions to ask/answer:

1. Is ATC working under ATC's Standard Client General Terms and Conditions (as modified 6/2002)

If this is the case, section 14 of the ATC Standard Client Terms and Conditions makes it the Client's responsibility to mark or furnish the locations of all underground man-made obstructions. It is the project manager's responsibility to ensure that this occurs.

2. Is ATC working under an existing Client-generated contract or contract other than that referenced in question 1 above?

If this is the case, it is the project manager's responsibility to read, understand and comply with ATC's responsibilities under the contract.

3. Is ATC entering into a new contract generated by the Client?


If this is the case, the contract must be sent to the legal department for review in accordance with the ATC Contract Policy. When sending the contract for review, the project manager must inform the legal department that the contract includes subsurface work.

4. Is ATC using a subcontractor for subsurface investigation?

If this is the case, all subcontractors must sign the ATC Standard Subcontract agreement and have an insurance certificate on file with the ATC corporate office evidencing the insurance required under the contract. ALL SUBCONTRACTS, SCOPE OF SERVICE STATEMENTS, WORK ORDERS AND TASK ORDERS MUST CONTAIN THE FOLLOWING PROVISION:

It shall be the responsibility of any Subcontractor, if the scope of services includes the taking of samples or the performance or supervision of remedial services (e.g. excavation, drilling, tank removal) or other invasive services, to investigate and identify all known utilities serving the project site(s) and the presence and location of hidden or obscure objects, including wiring, tanks, piping, etc., which may be injured or affected by its services.

Subcontractor agrees to indemnify and hold ATC harmless from all claims, suits, losses, personal injuries, death and property or economic damage resulting from

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damage or injury to hidden structures (pipes, tanks, electric wiring, telephone, etc.) arising from Subcontractor's performance of the services.

Once the contractual responsibilities of the parties are established, it is the continued responsibility of the project manager to ensure that the Operational Guidelines in section 5.3 of this policy are followed, and the Clearance Checklist (Appendix 33-1) referred to in section 5.3.2 is completed by the appropriate parties.

If there are any questions regarding contractual matters relating to risk management for subsurface investigations, contact:

**Kevin Hamilton ATC Legal Department
212-353-8280, ext. 223**

5.3 Operational Guidelines

The following guidelines are geared to the petroleum industry but it is ATC's intent that the basic approach be applied to a wide variety of subsurface investigations. The guidelines shall be followed prior to initiating any drilling/probing activities (including over-drilling to abandon wells). Successful implementation of this procedure requires:


- Recognition that people's lives and property are potentially at risk.
- Thorough planning and preparation.
- Discipline – in adhering to established procedures AND staying alert for circumstances that are not anticipated or adequately addressed by established procedures.
- Flexibility – to go beyond established procedures in response to actual circumstances.

5.3.1 Subcontractors

All subcontractors must sign an ATC standard Subcontract agreement and have an insurance certificate on file with the ATC Corporate Office evidencing the insurance required under the contract (refer to section 5.2, item 4).

5.3.2 Pre-Drilling Preparation

Pre-drilling preparation begins by completing the Clearance Checklist (see Appendix 33-1).

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5.3.2.1 Critical and Non-Critical Areas

Drilling locations are divided into Critical and Non-Critical Areas.

Critical Areas are within 10 (ten) feet of the perimeter of the UST pit area and within 10 (ten) feet of the drip line of the dispenser/rack canopy and all areas between the UST pit and the dispensers and between the dispenser/rack canopy and the store/office building. If a dispenser/rack canopy is not present, then the **Critical Area** shall be defined as extending 10 feet from the proximal edge of a dispenser island.

For Terminals, a Critical Area will also include any area within a diked location, any area between the above ground storage tanks and the rack and any area between the rack and the office building.


Non-Critical Areas include any area outside of a Critical Area.

There is a high risk of contacting underground utilities when working in Critical Areas. Alternatives should be evaluated before electing to drill or probe. If there are no acceptable alternatives, the ATC Project Manager, the Branch Manager, and Client Representative must approve drilling locations within any Critical Area prior to fieldwork.

Drilling/probing is generally NOT allowed in active product or vent line trenches.

Drilling/probing is generally NOT allowed in an active tank pit unless drilling is conducted through conductor casing that was placed in the tank pit prior to the installation of a new tank system. Other methods of sampling/well installation through an active tank pit should not be considered.

In some instances, client definitions of Critical Areas, and acceptable procedures for work in critical areas, may be different from (and more stringent than) those used by ATC. CHECK CLIENT REQUIREMENTS BEFORE SCOPING THE PROJECT AND AGAIN BEFORE STARTING WORK. WHEN CLIENT REQUIREMENTS ARE MORE STRINGENT THAN ATC's BE SURE TO FOLLOW CLIENT REQUIREMENTS.

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5.3.2.2 As-Built Drawings

Contact the Client Engineer or current Owner/Operator at least two (2) weeks prior to scheduled drilling or boring operations to obtain the most recent as-built site drawings, plans or photos showing the location of underground storage tanks (USTs), pipelines, vent lines, utilities, etc.

If as-built drawings are unavailable or the reliability of the drawings is in question, ask the Client to approve (and pay for):

- use of a private utility locator service to identify buried structures and;
- use of an air knife to prevent damage to buried structures (if technically appropriate).


Although the client may decline one or both items, it is important that the request be made and that both the request and client response be documented in writing.

Additionally, if drilling is anticipated in a Critical Area, ATC policy requires the use of a private utility locator service. You should also contact the UST system and/or leak detection installation contractor(s) prior to initiation of site subsurface activities for assistance in determining the location of onsite underground utilities.

Maintain written documentation of all attempts to obtain this information, including name, phone number and title of persons from which this information is requested or from whom the information is obtained.

5.3.2.3 Site Access

Obtain a written site access authority and permission from owner and operator before commencing borehole and utility markout activities. Such site access agreement shall acknowledge that due to the nature of the work, unavoidable damage may occur and that owner and operator waive their right of recovery for such unavoidable damage. If you need assistance with access agreements contact the ATC Legal Department.

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5.3.2.4 Pre-Plan Boring Locations

The client and direct supervisor must review site drawings to determine the safest drilling/boring locations and set exclusion zones around tank fields and/or pump islands, if applicable.

Discuss boring locations with all responsible parties, and remember that the exact locations of all underground tanks, lines, utilities, etc., may not be known or supplied by the client.

5.3.2.5 Establish Surface Boring Method

Determine technical and cost appropriateness of using "Air Knife" or similar method for work penetrating the first 5 feet below surface. If the client will not pay the cost to use the air knife, or it is technically inappropriate for the task to be performed, the client should be notified and alternatives proposed (such as hand auger or hand shovel).

5.3.2.6 Permits and Clearances


All necessary permits and utility clearances must be obtained and site access secured. ATC is responsible for compliance with applicable local, state, federal and client-specific regulations.

5.3.2.7 Borehole and Utility Markouts

- a) Identify and mark either with paint and/or with stakes the proposed boring locations.
- b) Contact a public underground utilities locating service to locate where utilities enter and travel on property or, if drilling offsite, locate offsite utilities. Refer to the attached One-Call Program List of telephone numbers in Appendix 33-2.

It is recommended that you contact a private underground utility locating service to locate onsite utilities. If drilling is anticipated inside a Critical Area, you are required to contact a private underground utility locating service.

Utility markout should be requested at least 48 hours (two days) prior to scheduled in initiation of drilling or boring activities. Some states/localities require additional advance

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notification. Be sure to check and follow any additional state/local requirements.

5.3.2.8 Safety (Site-Specific Health and Safety Plan)

A Site-Specific Health and Safety Plan (HASP) must be generated and reviewed by ATC health and safety personnel (e.g., Branch Safety Officer) before mobilizing to the site. The plan must identify tasks to be performed, the hazards associated with each task, and the precautions to be followed to control each hazard. Attachments to the HASP must include:

1. This Subsurface Investigation Procedure.
2. The Utility Location Checklist

The HASP and all attachments must be on site at all times when ATC or subcontractor personnel are present. The state's one-call confirmation number and expiration date must be listed on the Checklist.

5.3.2.9 Notifications


Unless client requests alternate timing, at least one (1) week prior to scheduled drilling or boring activities, notify the Client Engineer and Owner/Operator to provide them with sufficient time to adjust their operating schedules. If possible, confirm the client's drilling protocols at this time. A reminder call should be made to the site at least one (1) day in advance of site work.

In some instances, client requirements for notifications may be different from (and more stringent than) those used by ATC. CHECK CLIENT REQUIREMENTS BEFORE STARTING WORK. WHEN CLIENT REQUIREMENTS ARE MORE STRINGENT THAN ATC's BE SURE TO FOLLOW CLIENT REQUIREMENTS.

5.4 On-Site Procedures


5.4.1 Tailgate Safety Meeting

Prior to starting intrusive activities, a tailgate safety meeting with all site personnel must be conducted to provide clear direction regarding the items listed below. Acknowledgement of attendance at this tailgate

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meeting must be documented with an agenda of items discussed and a signatory page.

1. Verify that Site-Specific Health and Safety Plan and all required attachments are present;
2. Verify that the state dig permit is valid for the dates on which intrusive activities will take place;
3. Review tasks to be performed and precautions to be followed for each task;
4. Review emergency procedures, including location of fuel pumps shut-off switches;
5. Verify location of all utility markouts prior to starting intrusive activities;
6. No normal drilling/probing before investigation of boring locations is conducted as described in Table 1;
7. No drilling/probing (advancing the borehole) on retail petroleum projects without a project engineer or scientist present to observe;
8. Slow rate of auger/probe advancement for the initial 5-10 feet;
9. If pea gravel or other suspected backfill material is encountered, and was not expected or intended to be encountered, the following procedures must be followed:
 - Drilling/probing is immediately terminated. Contact client to determine new location for the boring.
 - Immediately contact the station manager or client personnel (Environmental Engineer and/or Network Development) to check on-site Veeder Root (or comparable automatic leak detection system) for any detection of a possible product loss due to drilling activities.
 - The boring should be cleaned of pea gravel/fill material by hand to see if any underground piping or utility was impacted. The boring should be left open temporarily to observe possible subsurface impact (i.e., flowing fluids, heavy vapors etc.).

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- The same procedures must be followed for the new location as listed above. (e.g., Discuss boring locations with all responsible parties and note that the exact locations of all underground tanks, lines, utilities, etc., may not be known or supplied by the client. If the existing utility markout leaves any doubt about the proximity to the new location, call utility locator service for an additional markout.)
- In the case in which pea gravel or other suspected backfill material cannot be avoided, the boring location should be considered within a Critical Area and proceed as described below. For flowing backfill materials such as sand and/or pea gravel, vacuum drilling or another alternative should be considered. **WIRE PROBES SHOULD NOT BE USED UNDER ANY CIRCUMSTANCES.**
- Report immediately, to ATC's Risk Management Department, any damage to buried or above ground utilities and structures that may have been caused by ATC's operations.

**Kevin Gara, ATC Risk Management Department
317-849-4990 x1422.**

5.4.2 Drilling/Probing Procedures

The zone of greatest risk for striking buried utilities is usually found within the first 5 feet below surface. The procedures in Table 1 (next page) are intended to minimize the risk of striking a buried utility in this zone of greatest risk. If for any reason a surface boring is not utilized, the ATC Project Manager, Branch Manager and Client Representative must approve drilling locations.

In work areas where the exact location of underground electric power lines is unknown, employees using jackhammers, bars, or other hand tools that may contact a line shall be provided with insulated protective gloves. Gloves must be rated to (or exceed) the voltage for which they may be exposed. The gloves shall be inspected before use and replaced as per the manufacturer's specifications.



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Table 1

	DRILLING/PROBLING PROCEDURES (First 5 feet below surface.)
Step 1 Site Walk	Conduct site walk. Verify that Utility Location Checklist has been fully completed.
Step 2 Locate Markouts	Locate all utility markouts and borehole locations. Start intrusive activities at least five (5) feet away and perpendicular to all marked utility lines.
Step 3 Break Surface Cover	Use a jackhammer or concrete saw to break through the asphalt or concrete surface cover. The drill bit on the rig may also be used on the asphalt cover. Do NOT advance bit or cutting tools beyond the asphalt or concrete cover.
Step 4 Surface Boring	<p>Use air knife with vacuum extractors, hand auger, post-hole digger or hand shovel to remove soil from the borehole to a depth of at least 5 feet below surface. The soil in the borehole should be excavated to a diameter of at least three inches greater than the diameter of the drill bit on the lead auger or drill stem that is to be used.</p> <p>If it is not possible to perform a surface boring which meets the diameter requirements as stated above, surface borings should be installed to the required depth of 5 feet surrounding the proposed well/boring location in such a manner that any lines/utilities passing through the proposed well/boring location will be encountered while installing the investigation borings/well.</p> <p>If pea gravel, fill material, or refusal is encountered, and was not expected to be encountered, abandon the boring and follow instructions from item #9 of section 5.4.1.</p>
Step 5 Soil Sampling	If soil samples are required to be collected within the first 5 feet below surface, a hand auger should be utilized to collect native, undisturbed soil samples.
Step 6 Borehole Protection	If no piping or other structures are encountered within the first 5 feet below surface, normal drill/probe activities may proceed with <u>caution</u> . Containerize drill cuttings as appropriate. If excavation of the borehole is conducted the day before actual drilling is conducted, the borehole should be covered with barricades or cones and with a sheet of material sufficient in strength to support a person's weight until it is ready to be drilled. If the borehole is of sufficient size to potentially cause damage to a vehicle if driven over, the borehole should be covered with a material sufficient in strength to support vehicular weight. In lieu of barricades or cones and a material cover, the boring may be temporarily backfilled to surface. If a backfill material is utilized, it is important for the material to be flush with the surrounding pavement.

5.5 Supplemental Information

The Checklist and this Supplemental Information are NOT to be utilized in lieu of employing appropriate health and safety precautions in the field. All site activities are to be conducted in accordance with the Health and Safety Plan prepared specifically for your site and the current scope of work.

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5.5.1 Road Right-of-Way (ROW)

- **NO** intrusive activities (e.g., drilling, monitoring well sampling, etc.) are to be conducted without **written permission** from the **legal** property owner.
- Road Right-of-Way(s) generally extend from the centerline of a road to a set distance on each side of the road. The width of ROWs varies significantly. The main purpose of the road ROW is to allow ingress and egress for utility companies and/or government agencies to install and maintain public utilities. The road ROWs are generally crowded with buried utility lines including natural gas, industrial pipelines, electrical, telephone (e.g., fiber optic), cable television, etc.
- Intrusive activities (e.g., drilling, excavations, etc.) should not be conducted within 60 feet of the centerline of a railroad or road ROW, unless it is totally evident that these activities are being conducted on the site and that ATC has obtained proper authorization to perform the scope of work by the legal property owner.
- Conducting work (especially subsurface investigation activities) in ROWs generally requires completion of a "formal" permit process including a permit application, permit fee, agency inspection, etc.

5.5.2 Right-of-Entry (ROE) for Private Property


- **NO** work (especially intrusive activities such as drilling, etc.) is to be conducted without **written permission** from the **legal** property owner.

5.5.3 Overhead Utility Lines (e.g., electrical, telephone, cable television, etc.)

- While conducting site activities near overhead lines, field personnel need to be aware of the location of the lines so as not to use conductive equipment (e.g., metal equipment to include: drill rigs; hand auger extensions; geoprobe units; excavators, etc.) in close proximity to power lines.

OSHA 29 CFR 1926.550 requires that any vehicle or mechanical equipment (i.e., drill rigs) capable of having parts of its structure elevated near energized overhead lines shall be operated so that a clearance distance of at least 10 feet is maintained.

When calculating clearance distances for a drill rig consider both the length of the derrick and the length of the rods. Position the rig such that if rods are

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ever fully extended from the top of the derrick, the rods will still be at least 10 feet away from the power lines. Note that rods can lean or sway when elevated so it may be necessary to maintain more than a 10-foot distance on the ground to ensure that there is a 10-foot horizontal distance between the rods and the power line.

Higher voltages require greater clearance distances. Contact the electrical utility company to verify line voltage. If the voltage is higher than 50kV, OSHA requires the clearance shall be increased 4 in. for every 10kV over that voltage.

Table 33-1	
Voltage	Required Clearance
0-50 kV	10 feet
50-200 kV	15 feet
200-350 kV	20 feet
350-500 kV	25 feet
500-750 kV	35 feet
750-1000 kV	45 feet

If insulating barriers (boots) are installed to prevent contact with the lines, and if the barriers are rated for the voltage of the line being guarded and are not a part of or an attachment to the vehicle or its raised structure, OSHA allows the clearance to be reduced to a distance within the designed working dimensions of the insulating barrier. However, while this is permissible according to OSHA, some utility companies are recommending that safe distances, as described in Table 33-1, be maintained in addition to the insulating barrier.


For further information regarding electrical safety and overhead electrical lines refer to 5.2.3 in section 12 of the ATC Employee Health and Safety Policy Manual.

5.5.4 Site Maps

- Site maps are to include ALL utility lines (overhead and buried) and the type of lines (e.g., electric, etc.) should be properly identified on the maps.

5.5.5 Fire Suppression Systems

- Fire suppression systems are not usually part of a public utility clearance service. A visual inspection of the site may reveal the presence of post indicator valves (indicating the presence of buried piping).

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5.5.6 Water and Sewer Lines

Sanitary sewer services and mains are sometimes not marked. Identify the location of bathrooms and other portions of the building(s) with supplied water (e.g., kitchens, cafeterias, etc.), in addition to sewer "cleanouts," to aid in identifying the locations of buried water and/or sewer pipes. Storm sewer manways are often "interconnected" below grade. When viewing the inside of the stormsewer manways, locate the ends of the piping in the manway and identify which direction the pipes travel. This will help determine if manways are connected below grade.

6.0 REFERENCES

49 CFR 198.37

29 CFR 1910 Subparts F and N

29 CFR 1926 Subparts H, N, O, and W



Appendix 33-1

Checklist For Subsurface Clearance

MUST be filled out PRIOR to the Start of Field Activities

NO subsurface work in road Right of Ways or Off-Site (property boundary) without Written Authorization

Person
Verifying
Each Item to
Place Initials
On Lines
Below and
Sign Bottom
of Page

Site Name: _____

Site Address: _____

Project No.: _____

Comments

To understand and use this checklist correctly you must refer to and follow ATC's Subsurface Investigation Procedures.

PRE-DRILLING PREPARATION

- Review definition of "Critical" and "Non-Critical" areas.
- Request as-built drawings, and/or approval to use private utility locator service and/or air knife to locate/protect subsurface utilities.
- Obtain site access agreement.
- Pre-plan boring locations.
- Establish surface boring method.
- Obtain permits and clearances.
- Do borehole and utility markouts.
- Establish site-specific Health and Safety Plan
- Notify client, owner, operator prior to mobilization.

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

If not using Air Knife-type technology, why?.

ON-SITE PROCEDURES

- Conduct tailgate safety meeting with topics as indicated in procedure.
- Read and follow Drilling/Probing procedures
- 1. Do site walk and verify that utility location checklist is complete.
- 2. Locate all markouts and planned borehole locations. Start intrusive procedures at least 5 feet away from and perpendicular to utility markouts.
- 3. Break surface cover.
- 4. Do surface boring to required depth using hand auger, post-hole digger, shovel or "air knife".
- 5. If necessary, use alternate procedure for surface boring.
- 6. Collect soil samples by hand augering to required depth.
- 7. Protect the borehole from pedestrian and vehicular traffic.

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

*Buried utilities can be found at any depth, but are most often found within the first 5 feet below the ground surface. Proceed slowly and with extra caution when working within 5 feet of the ground surface.

NOTES:

SIGNATURE

DATE

MUST be filled out PRIOR to the Start of Field Activities

NO subsurface work in road Right of Ways or Off-Site (property boundary) without Written Authorization

Site Address: _____ If Present --

Site Safety Documents (on-site during activities)

Utility Staking Request Form (properly completed for current scope of work)?

Site Health and Safety Plan?

"Yes or No" Fill Out, as applicable

Yes No Ticket # and Expir. Date: # / /

Yes No Hospital Location Map Available Yes No

**Utility Identification "color"
Above Ground (AG) / Buried (B)**

Natural Gas (Yellow) / Staked?	AG / B	Yes	No	NW	NE	SE	SW
Electrical (Red) / Staked?	AG / B	Yes	No	NW	NE	SE	SW
Telephone/Fiber Optic (Orange) / Staked?	AG / B	Yes	No	NW	NE	SE	SW
Cable TV (Orange) / Staked?	AG / B	Yes	No	NW	NE	SE	SW
Water (Blue) / Staked?	AG / B	Yes	No	NW	NE	SE	SW
Sewer (Green) / Staked?	AG / B	Yes	No	NW	NE	SE	SW

**Identify on a Site Map the Location of ALL
Lines & Meters (or actual utility) and Indicate
Nearest Building Quadrant (NE, SE, SW, or
NW)**

Significant Site Features

UST system (UST cavity, dispenser islands, piping runs, vent pipes etc.)?
Above Ground Storage Tanks – ASTs (dispenser islands, piping runs)?
Electrical Transformers?
Area Lighting (Pole mounted lighting, etc.)?
Signage with electrical power (Business/Company signs, etc.)?
Underground lawn/landscaping sprinkler system?
Storm drain catch basins / man-ways and potential connecting conduits/lines?

Yes No
Yes No
Yes No
Yes No
Yes No
Yes No
Yes No

**Site Feature Located in Closest Property
Quadrant
(NE, SE, SW, or NW). Also Identify on Site
Map.**

Other

Pavement distress (Cracked pavement, "buckled" asphalt, etc.)? Yes No

**"Other" Concerns Located in Closest
Property
Quadrant (NE, SE, SW, or NW). Identify on
Site Map.**

*Buried utilities can be found at any depth, but are most often found within the first 5 feet below the ground surface. Proceed slowly and with extra caution when working within 5 feet of the ground surface.

NOTES:

SIGNATURE

DATE



Appendix 33-2
One Call Program List


STATE	CENTER	PHONE
Alabama	Alabama Line Location Center	800-292-8525
Alaska	Locate Call Center of Alaska	800-478-3121
Arizona	Arizona Blue Stake	800-782-5348
Arkansas	Arkansas One Call System	800-482-8998
California	Underground Service Alert North	800-227-2600
	Underground Service Alert South	800-227-2600
Colorado	Utility Notification Center of Colorado	800-922-1987
Connecticut	Call Before You Dig	800 922-4455
Delaware	Miss Utility of Delaware	800-282-8555
Florida	Call Sunshine	800-432-4770
Georgia	Utilities Protection Center	800-282-7411
Hawaii	Underground Service Alert North	800-227-2600
Idaho	Palouse Empire Underground	800 822-1974
	Utilities Underground Location Center	800-424-5555
	Dig Line	800-342-1585
	One Call Concepts - Idaho	800-626-4950
	Shoshone County One Call	800-398-3285
Illinois	JULIE	800-892-0123
	Digger (Chicago Utility Alert Network)	312-744-7000
Indiana	Indiana Underground Plant Protection	800-382-5544
Iowa	Underground Plant Location Service	800-292-8989
Kansas	Kansas One-Call Center	800-DIG-SAFE
Kentucky	Kentucky Underground Protection	800-752-6007
Louisiana	Louisiana One Call System	800-272-3020

Maine	Dig Safe - Maine	888-DIG-SAFE
Maryland	Miss Utility	800-257-7777
	Miss Utility of DELMARVA	800-282-8555
Massachusetts	Dig Safe - Massachusetts	888-DIG-SAFE
Michigan	Miss Dig System	800-482-7171
Minnesota	Gopher State One Call	800-252-1166
Mississippi	Mississippi One-Call System	800-227-6477
Missouri	Missouri One-Call System	800-344-7483
Montana	Utilities Underground Location Center	800-424-5555
	Montana One Call Center	800-551-8344
Nebraska	Diggers Hotline	800-331-5666
Nevada	Underground Service Alert North	800-227-2600
New Hampshire	Dig Safe- New Hampshire	888-DIG-SAFE
New Jersey	Garden State Underground	800-272-1000
New Mexico	New Mexico One Call System	800-321-ALERT
	Las Cruces-Dona Ana Utility Council	888-526-0400
New York	Underground Facilities Protective	800-962-7962
	New York City-Long Island One Call	800-272-4480
North Carolina	North Carolina One Call Center	800-632-4949
North Dakota	Utilities Underground Location Center	800-795-0555
Ohio	Ohio Utilities Protection Service	800-362-2764
	Oil and Gas Producers Underground Protection	800-925-0988
Oklahoma	Call Okie	800-522-6543
Oregon	Oregon Utilities Notification Center	800-332-2344
Pennsylvania	Pennsylvania One Call System	800-242-1776
Rhode Island	Dig Safe - Rhode Island	888-DIG-SAFE
South Carolina	Palmetto Utility Protection Service	888-721-7877

South Dakota	South Dakota One Call	800-781-7474
Tennessee	Tennessee One-Call System	800-351-1111
Texas	Texas One Call System	800-245-4545
	Texas Excavation Safety System	800-344-8377
	Lone Star Notification System	800-669-8344
Utah	Blue Stakes Location Center	800-662-4111
Vermont	Dig Safe - Vermont	888-DIG-SAFE
Virginia	Miss Utility of Virginia	800-552-7001
	Miss Utility	800-257-7777
	Miss Utility of DELMARVA	800-441-8355
Washington	Underground Utilities Notification Center Center	800-424-5555
	Grays Harbor & Pacific County Utility	206-532-3550
	Utilities Council of Cowlitz County	360-425-2506
	Chelan-Douglas Utilities Coordinating	509-663-6111
	Upper Yakima County Underground	800-553-4344
	Inland Empire Utility Coordinating	509-456-8000
	Palouse Empire Utilities Coordinating	
	Utilities Notification Center	800-332-2344
West Virginia	Miss Utility of West Virginia	800-245-4848
Wisconsin	Diggers Hotline	800-242-8511
Wyoming	Wyoming One-Call	800-348-1030
	Call Before You Dig Wyoming	800-849-2476
District of Columbia	Miss Utility	800-257-7777
Canada	Alberta One-Call	800-242-3447
	Ontario One-Call System	800-400-2255
	Info-Excavation (Quebec)	800-663-9228

	BC One-Call	800-474-6886
Republic of China	Dig Center, Directorate General of Telecommunications	02-351-2345
Scotland	Susiephone	800-800-333
Australia	Perthe One-Call System	61-9-1100
	Melborne One-Call Service	61-3-1100
	Sydney One-Call Service	612 9806 0400
Finland	Johtieto Oy	011-358-02-271-1181

If you cannot find the One-Call Center for your area, call the North American One-Call Referral Service at (888) 258-0808.

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1.0 Policy

Work activities involving welding and cutting shall be conducted in a safe manner.

This policy covers minimum performance standards applicable to all ATC Associates employees and locations. Local practices requiring more detailed or stringent rules, or local, state or other federal requirements regarding this subject can and should be added as an addendum to this procedure as applicable.

2.0 Purpose

To define the safety requirements for welding, cutting, brazing, metals grinding, and other hot work.

3.0 Scope

Applies to ATC Associates work sites, i.e., ATC offices, client job sites, etc., where welding and cutting operations are required.

4.0 Definitions

Authorized Persons means the senior ATC Associates employee for the work area or a designated Site Safety Officer for that work site.

Authorized Free-Burn Area means a work area where no sources of combustion are present, therefore, no 'Hot Work Permit' would be required.


Combustible means any material that has the possibility of catching fire or supporting a fire.

Fire watch means employee(s) trained and assigned to monitor or watch for potential fire hazards and generally warn others in the event of an emergency or unsafe condition.

Hot Work means the performing of operations capable of providing a source of ignition, e.g. riveting, welding, cutting, grinding, soldering, burning and heating.

5.0 Requirements

5.1 General

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Authorized hot work areas for welding and cutting shall be free of flammable and combustible materials, provided with adequate fire extinguishing equipment, and properly screened off to prevent viewing of welding operations.

Welding equipment shall be chosen for safe application to the work to be done.

5.2 Hot Work Permits

Permits for Hot Work are required for welding, cutting and brazing operations exclusive of those areas designated as authorized free-burn areas.

When hot work is to be performed outside of a hot work area, the employee or contractor performing the hot work shall complete a Hot Work Permit (reference Appendix 31-2) before commencing work. Upon completion of the work, the permit shall be turned in to the permit issuer.

Permit issuers shall retain returned permits for a minimum of two (2) months from the date of return. It is the responsibility of the Branch Safety Officer to maintain a file for returned permits.

A new permit shall be completed where there is an interruption in the work process, such as meal breaks, shift changes, work condition changes or generally left unmonitored for significant periods of time.

Before beginning hot work activities, the affected area(s) shall be inspected and results documented on the Hot Work Permit


Only authorized persons are allowed to use flame or spark producing equipment.

Air monitoring shall be conducted in accordance with the established procedures and regulations as defined in the Industrial Hygiene section (23).

5.3 Fire Prevention and Protection

If the object to be welded or cut cannot be readily moved to an area designated for hot work, all moveable fire hazards in the vicinity shall be moved at least 35 feet from the work site.

Combustibles and flammables that cannot be relocated shall be isolated from ignition sources by flameproof covers or otherwise shielded with metal or fire-resistant guards or curtains.

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Appropriate fire extinguishing equipment shall be readily available for use whenever hot work is performed.

A fire watch standby shall be provided when welding or cutting is performed where there is a potential for a fire for a minimum of thirty (30) minutes at the completion of hot work activities.

5.4 Confined Spaces

Hot work performed in confined spaces shall also conform to the Confined Space Policy Section (10) of this Manual.

5.5 Compressed Gas Cylinders

Empty cylinders shall be labeled as such and kept separate from full cylinders.

Cylinders shall be kept in an upright position, particularly those containing liquefied gas or acetylene.

When transporting cylinders, they shall be secured, gauges removed, kept in an upright position and capped.

Cylinders shall be secured against being knocked over with a non-combustible restraint such as a chain.


Oxygen cylinders in storage shall be separated from fuel-gas cylinders or flammable/combustible materials (especially gasoline, oil or grease) by a minimum of twenty (20) feet or by a non-combustible barrier, at least five (5) feet in height.

The metal cylinder cap shall be in place to protect the valve when a cylinder is not connected for use.

Threads on a regulator or union shall correspond to those on the cylinder valve outlet. *DO NOT* force connections that do not fit.

Open cylinder valves slowly. A cylinder not provided with a hand wheel valve shall be opened with a spindle key or a special wrench or other tool provided or approved by the gas supplier or manufacturer.

DO NOT use a cylinder of compressed gas without a pressure-reducing regulator attached to the cylinder valve, unless attachment is to a manifold that contains its own regulator.

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Before making connection to a cylinder valve outlet, “crack” the valve for an instant to clear the opening of particles of dust or dirt. Always point the valve and opening away from the body and not toward anyone else. NEVER crack a fuel gas cylinder valve near other welding work, sparks, open flames or other sources of ignition.

Use regulators and pressure gauges only with the gases for which they were designed and intended. DO NOT attempt to repair or alter cylinders, valves or attachments. The glass face of gauges shall be kept intact or replaced prior to use.

Gauges shall be turned off and hoses shall be ‘bled’ when not in use.

All fuel-gas welding, burning, cutting equipment shall be equipped with a check valve, preferably located at the torch-end of the system.

5.6 Energy Control (Lockout)


When systems must be shut down to accomplish the hot work, the shutdown shall be performed in accordance with the Energy Control procedures (Lockout) section (14) of this manual.

5.7 Welding or Cutting of Containers and Piping

No hot work shall be performed on used drums, barrels, tanks, or other containers until it can be determined that no flammable materials or other materials are present which, when subject to heat, might produce flammable or toxic vapors. Containers shall be adequately vented to the atmosphere to prevent explosion. When containers do contain flammable or toxic materials, the following precautions shall be taken:

- Piping to the containers shall be disconnected or blanked off
- The container shall be cleaned of the flammable or toxic materials; and/or
- The container shall be purged with an inert gas
- After purging is completed, the atmosphere in the container shall be sampled to ensure it is safe for hot work

If the above precautions cannot be accomplished, the container shall be completely filled with water before the hot work is performed.

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5.8 Fire Watch

5.8.1 Training

Personnel assigned to perform "Fire Watch" duties shall be trained prior to assignment to perform such duties. Training shall include:

- Use of fire fighting equipment such as extinguishers and water hoses
- Emergency notification procedures
- Property of fires
- Duties of a "Fire Watch"
- Potential hazards
- Use of emergency equipment

5.8.2 Responsibilities


5.8.2.1 Supervisors

Supervisors are responsible for ensuring personnel assigned to perform "Fire Watch" duties have received adequate instruction and training.

5.8.2.2 Fire watch personnel

The primary responsibility of a "Fire Watch" is to monitor for potential fire hazards and the presence of fire during operations such as welding and cutting. This includes:

- Having the ability to communicate to employees (including all languages spoken by employees performing work in the area being monitored)
- Continuously monitor the area surrounding the immediate work area for conditions that could result in a fire or explosion
- Immediately stop all "hot work" in the event of an emergency or other unplanned event affecting the safety of employees
- Know the permit requirements relative to fire protection and ensure they are being followed as work is being performed

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- Extinguish fires when they occur if possible. When a fire occurs, all work must be discontinued and the supervisor or designated contact must be notified immediately
- When a fire or fire potential is not controllable, follow applicable emergency procedures
- Remain at the assigned location at all times, except when evacuating
- Perform no other work that will interfere with fire watch duties
- Remain at the work site for at least 30 minutes after welding, torch cutting and other such hot work operations have ceased to ensure smoldering other potential fire conditions do not exist
- Upon completion of work and it is determined smoldering fires are not present, the "Fire Watch" is responsible for returning and/or storing fire fighting equipment to it's original location as directed by the supervisor or other responsible person

5.9 Ventilation


Adequate ventilation (natural, mechanical, or respirator) shall be provided for welding, cutting, brazing and related operations to ensure permissible exposure levels are not exceeded.

Before welding, cutting or grinding is commenced on any surface covered by a preservative coating whose composition is not known, a test shall be made by a competent person for hazard determination. Work processes shall be modified based on the test results.

When welding, cutting or burning galvanized or cadmium plated metal, local exhaust ventilation or a respirator shall be required.

5.10 Protection of Employees

Outer clothing shall be free from oil or grease.

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Synthetic or plastic clothing shall not be worn.

Welding helmets and face shields shall be used to protect the face, forehead, neck and ears from direct radiant energy from the arc and from weld spatter.

Sleeves and collars shall be kept buttoned. Pockets shall be emptied of flammable or readily combustible material. Pants shall not have cuffs and shall not be turned up on the outside. Pants shall overlap shoe tops to prevent spatter from getting into shoes.

If respiratory protection is required, respirators shall be used in accordance with Respiratory Protection section (27) of this manual.

Fire resistant screens or curtains shall be used around the welding area to protect-passers-by from flying sparks and direct view of the arc.

When welding or cutting with covered electrodes using alternating current (AC) single-phase transformer-rectifier arc welding machines and under electrically hazardous conditions, the welding operator shall use dry gloves and clothing, non-conductive footwear, and avoid accidental contact with live electrical parts.


Filter Lens Shades shall be selected in accordance with Appendix 31-1.

5.11 Operations & Maintenance

5.11.1 Arc Welding and Cutting

Employees assigned to operate or maintain arc welding shall be acquainted with the OSHA requirements for Welding, Cutting and Brazing (29CFR1910.252). If performing gas-shielded arc welding, employees must also be acquainted with the Recommended Safe Practices for Gas-Shielded Arc Welding, A6.1-1966, American Welding Society.

Before starting operations, all connections to the machine shall be checked to make certain they are properly made. The work lead shall be firmly attached to the work and magnetic work clamps shall be freed from adherent metal particles of spatter on contact surfaces. Coiled welding cable shall be spread out before use to avoid serious overheating and damage to insulation.

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Grounding of the welding machine frame shall be checked. Special attention shall be given to safety ground connections of portable machine.

There shall be no leaks of cooling water, shielding gas or engine fuel. Proper switching equipment for shutting down the machine must be provided.

Printed rules and instructions covering operation of equipment supplied by the manufacturer shall be strictly followed.

Electrode holders, when not in use, shall be so placed that they cannot make electrical contact with persons, conducting objects, fuel, or compressed gas tanks. Cables with splices within ten (10) feet of the holder shall not be used. The welder should not coil or loop welding electrode cable around parts of his or her body.

Operators shall report any equipment defect or safety hazard to his or her supervisor and the use of the equipment shall be discontinued until its safety has been assured. To ensure that defective or unsafe equipment is not used until properly repaired, a "Do Not Operate" or comparable tag should be placed on the unit. Repairs shall only be made by qualified personnel.


Machines which have become wet shall be thoroughly dried and tested before being used.

Cables with damaged insulation or exposed bare conductors shall be replaced. Joining lengths of work and electrode cables shall be done by the use of connecting means specifically intended for that purpose. The connecting means shall have insulation adequate for the service conditions.

5.11.2 Oxygen-Fuel Gas Welding & Cutting

Only approved apparatus such as torches, regulators or pressure-reducing valves, or acetylene generators, and manifolds shall be used.

Workers in charge of oxygen or fuel-gas supply equipment, including generators, and oxygen or fuel-gas distribution piping systems shall be instructed and judged competent for this work

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before being left in charge. Rules and instructions for operation and maintenance of oxygen or fuel-gas supply equipment including oxygen or fuel-gas distribution piping systems shall be readily available.

Cylinders, cylinder valves, couplings, regulators, hose, and apparatus shall be free from oily or greasy substances. Oxygen cylinders or apparatus shall not be handled with oily hands or gloves. A jet of oxygen must never be permitted to strike an oily surface, greasy clothes, or enter a fuel oil or other storage tank.

Cylinders shall not be dropped or struck or permitted to strike each other violently.

Unless cylinders are secured on a special truck, regulators shall be removed and valve protection caps put in place before cylinders are moved. Cylinder valves shall be closed before moving cylinders, and when work is finished. Valves of empty cylinders shall be closed.


Cylinders shall be kept far enough away from the actual welding or cutting operation so that sparks, hot slag, or flames will not reach them, or fire-resistant shields shall be provided.

Before a regulator is removed from a cylinder valve, the valve shall be closed and the gas released from the regulator. Nothing shall be placed on top of an acetylene cylinder when in use which may damage the safety device or interfere with the quick closing of the valve.

If cylinders are found to have leaky valves or fittings which cannot be stopped by closing of the valve, the cylinders shall be taken outdoors away from sources of ignition, and slowly emptied.

Fuel-gas shall never be used from cylinders through torches or other devices equipped with shutoff valves without reducing the pressure through a suitable regulator attached to the cylinder valve or manifold.

The cylinder valve shall always be opened slowly. An acetylene cylinder valve shall not be opened more than one and one-half turns of the spindle, and preferably no more than three-fourths of

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a turn. Where a special wrench is required, it shall be left in position on the stem of the valve while the cylinder is in use so that the fuel-gas flow can be quickly turned off in case of emergency. In the case of manifolded or coupled cylinders at least one such wrench shall always be available for immediate use.

Manifolds shall be approved either separately for each component part or as an assembled unit.

Where parallel lengths of oxygen and acetylene hose are taped together for convenience and to prevent tangling, not more than 4 inches out of 12 inches shall be covered by tape. Hoses showing leaks, burns, worn places, or other defects rendering it unfit for service shall be repaired or replaced.

Pressure-reducing regulators shall be used only for the gas and pressures for which they are intended.

6.0 References

OSHA 29 1910 Subpart Q

OSHA 29 1926 Subpart J



Appendix 31-1
FILTER LENS SHADE SPECIFICATIONS

Welding Operation	Suggested Shade Number
Shielded metal-arc welding, up to 5/32 in. (4 mm) electrodes	10
Shielded metal arc welding, 3/16 to 1/4 in. (4.8 to 6.4 mm) electrodes	12
Shielded metal-arc welding, over 1/4 in. (6.4 mm) electrodes	14
Gas metal-arc welding (nonferrous)	11
Gas metal-arc welding (ferrous)	12
Gas tungsten-arc welding	12
Atomic hydrogen welding	12
Carbon arc welding	14
Torch soldering	2
Torch brazing	3 or 4
Light cutting, up to 1 in. (25 mm)	3 or 4
Medium cutting, 1 to 6 in. (25 to 150 mm)	4 or 5
Heavy cutting, over 6 in. (150 mm)	5 or 6
Gas welding (tight) up to 1/8 in. (3.2 mm)	4 or 5
Gas welding (medium) 1/8 to 1/2 in. (3.2 to 12.7 mm)	5 or 6
Gas welding (heavy) over 1/2 in. (12.7 mm)	6 or 8

The choice of a filter shade may be made on the basis of visual acuity and may therefore vary widely from one individual to another, particularly under different current densities, materials, and welding processes. However, the degree of protection from radiant energy afforded by the filter plate or lens chosen to allow visual acuity shall still remain in excess of the needs of eye filter protection. Filter plate shades as low as shade 8 have proven suitably radiation-absorbent for protection from the arc welding processes.

NOTE: In gas welding where the torch produces a high yellow light, it is desirable to raise a filter lens that absorbs the yellow or sodium line in the visible light of the operation (spectrum).



Appendix 31-2
Welding & Cutting Hot Work Permit

Supervisor: _____ Date _____ Permit No. _____

Description of Work: _____

Location of Work: _____

List Names of Persons Performing Work

_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

“Fire Watch” Personnel

Check the Appropriate Boxes

Permits Required-List	Y	N	NA
Confined Space			
Excavation			
Hot Tapping			
Line Break			
Other			
Training Verified	Y	N	NA
Employees			
Fire Watch			
Confined Space Attendant			
Equipment Operators			
Fire Watch			
Other			
Drawings Reviewed	Y	N	NA
Flow Diagrams			
Underground Systems			
Electrical & Pneumatic			
Drains, Storage, Systems			
Other			

Equipment-Tools-Material	Y	N	NA
Scaffolds & Ladders			
Non Sparking Tools			
Fall Protection in place			
Temporary Platforms			
Airline Respiratory Systems			
Self Contained Breathing Units			
Monitoring Instruments			
Chemical, Acid, Thermal Suits			
Faceshields, Goggles, Hoods			
Fire Extinguishing Equipment			
Other			
Other			
Other			
Other			
Other			
Other			
Other			

Items Completed	Y	N	NA
Lines/ Vessels/Systems Purged			
Lines, Vessels, Systems Clean			
Mechanical Ventilation In Place			
Drains and Sewers Covered			
Valves Closed or Safe Position			
Energy Systems Locked Out			
Blinds Installed			
Systems De-energized, Isolated			
Checked for Benzene			
Checked for Lead			
Checked for Asbestos			
Checked for Combustibles			
Monitoring System in Place			
Other			
Other			
Other			
Other			
Other			

SAMPLING AND MONITORING RESULTS (This Section to be completed prior to work commencing)

Substance	Oxygen	Combustible	Other	Other	Other	Other	Other
% or LEL	%	LEL					
Date/Time							
Initials							

List Type of Sampling Equipment: _____ Calibrated Date: _____

Sampling Conducted by: _____ Date: _____ Time: _____

Special Instructions: _____

Initiated by: _____

Reviewed by: _____

Approved by: _____



Appendix 31-1
FILTER LENS SHADE SPECIFICATIONS

Welding Operation	Suggested Shade Number
Shielded metal-arc welding, up to 5/32 in. (4 mm) electrodes	10
Shielded metal arc welding, 3/16 to 1/4 in. (4.8 to 6.4 mm) electrodes	12
Shielded metal-arc welding, over 1/4 in. (6.4 mm) electrodes	14
Gas metal-arc welding (nonferrous)	11
Gas metal-arc welding (ferrous)	12
Gas tungsten-arc welding	12
Atomic hydrogen welding	12
Carbon arc welding	14
Torch soldering	2
Torch brazing	3 or 4
Light cutting, up to 1 in. (25 mm)	3 or 4
Medium cutting, 1 to 6 in. (25 to 150 mm)	4 or 5
Heavy cutting, over 6 in. (150 mm)	5 or 6
Gas welding (tight) up to 1/8 in. (3.2 mm)	4 or 5
Gas welding (medium) 1/8 to 1/2 in. (3.2 to 12.7 mm)	5 or 6
Gas welding (heavy) over 1/2 in. (12.7 mm)	6 or 8

The choice of a filter shade may be made on the basis of visual acuity and may therefore vary widely from one individual to another, particularly under different current densities, materials, and welding processes. However, the degree of protection from radiant energy afforded by the filter plate or lens chosen to allow visual acuity shall still remain in excess of the needs of eye filter protection. Filter plate shades as low as shade 8 have proven suitably radiation-absorbent for protection from the arc welding processes.

NOTE: In gas welding where the torch produces a high yellow light, it is desirable to raise a filter lens that absorbs the yellow or sodium line in the visible light of the operation (spectrum).



Appendix 31-2
Welding & Cutting Hot Work Permit

Supervisor: _____ Date _____ Permit No. _____

Description of Work: _____

Location of Work: _____

List Names of Persons Performing Work

_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

“Fire Watch” Personnel

Check the Appropriate Boxes

Permits Required-List	Y	N	NA
Confined Space			
Excavation			
Hot Tapping			
Line Break			
Other			
Training Verified	Y	N	NA
Employees			
Fire Watch			
Confined Space Attendant			
Equipment Operators			
Fire Watch			
Other			
Drawings Reviewed	Y	N	NA
Flow Diagrams			
Underground Systems			
Electrical & Pneumatic			
Drains, Storage, Systems			
Other			

Equipment-Tools-Material	Y	N	NA
Scaffolds & Ladders			
Non Sparking Tools			
Fall Protection in place			
Temporary Platforms			
Airline Respiratory Systems			
Self Contained Breathing Units			
Monitoring Instruments			
Chemical, Acid, Thermal Suits			
Faceshields, Goggles, Hoods			
Fire Extinguishing Equipment			
Other			
Other			
Other			
Other			
Other			
Other			
Other			

Items Completed	Y	N	NA
Lines/ Vessels/Systems Purged			
Lines, Vessels, Systems Clean			
Mechanical Ventilation In Place			
Drains and Sewers Covered			
Valves Closed or Safe Position			
Energy Systems Locked Out			
Blinds Installed			
Systems De-energized, Isolated			
Checked for Benzene			
Checked for Lead			
Checked for Asbestos			
Checked for Combustibles			
Monitoring System in Place			
Other			
Other			
Other			
Other			
Other			

SAMPLING AND MONITORING RESULTS (This Section to be completed prior to work commencing)

Substance	Oxygen	Combustible	Other	Other	Other	Other	Other
% or LEL	%	LEL					
Date/Time							
Initials							

List Type of Sampling Equipment: _____ Calibrated Date: _____


Sampling Conducted by: _____ Date: _____ Time: _____

Special Instructions: _____

Initiated by: _____

Reviewed by: _____

Approved by: _____

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1.0 Policy

Any motor vehicle used to conduct company-related business shall be operated safely in accordance with jurisdictional highway/roadway laws and ATC Associates requirements.

This policy covers minimum performance standards applicable to all ATC Associates employees and locations. Local practices requiring more detailed or stringent rules, or local, state or other federal requirements regarding this subject can and should be added as an addendum to this procedure as applicable.

2.0 Purpose

To define the procedures for the safe operation of motor vehicles in company-related business activities.

3.0 Scope

Applies to all ATC Associates drivers using motor vehicles to conduct company business.

4.0 Definitions

Driver means operators of company owned, leased, rented, motor vehicles or any private motor vehicles used for conducting company business.

Motor Vehicle Report (MVR) means a report obtained from the records of the relevant state authority that gives the activity of an individual's driving record.


Accident means an incident involving a motor vehicle that results in injury and/or property damage.

5.0 Requirements

5.1 Responsibilities

5.1.1 Corporate Director of Risk Management

The success of any loss control program depends on corporate commitment and support. The Corporate Director of Risk Management (CDRM), working at the direction of the senior management team, is responsible for establishing a company policy and providing leadership for

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the prevention of vehicular accidents. Corporate direction will include the following:

- 1) Issue to field management instructions advising them of their responsibilities in controlling vehicular accidents and requiring them to comply with the provisions of this Fleet Safety Program.
- 2) Issue letters and bulletins on accident prevention problems as needed, and review recommendations when submitted.
- 3) Periodically check on the progress of the program with field supervisory personnel.
- 4) Maintain copies of driver qualification files, as submitted by Local DOT Coordinators, and periodically audit selected files as a means to promote compliance with 49 CFR 391 regulations.
- 5) Maintain an accident register or log on all fleet incidents for the purpose of analyzing the collected data systematically to identify trends or problem areas.
- 6) Track and file accident reports, as submitted by Local DOT Coordinators, for any DOT reportable collisions.
- 7) Establish a system that will ensure drivers' operating licenses, DOT medicals, annual reviews and record of violations remain current.


5.1.2 Corporate Fleet Manager

(THIS SECTION RESERVED FOR PETER POMPONI)

5.1.3 Local Fleet Safety Coordinator (Branch Manager - Safety Officer)

The Branch Manager is ultimately responsible and accountable for program implementation and compliance with applicable regulations. The Branch Manager may delegate operational responsibility to a designee to serve as the "Fleet Safety Coordinator." The Fleet Safety Coordinator's duties (or Branch Manager duties, if not delegated) will include the following:

- 1) Responsibility for overall direction and coordination of the fleet control activities at the local level.
- 2) Determine if the basic procedures of the Fleet Control Program are being followed.


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- 3) Distribute special interest bulletins and safety literature for use in conjunction with driver safety meetings and driver training.
- 4) Ensure the company's written hiring policies/procedures are being followed on all new hires.
- 5) Assist in the investigation of company vehicle (or rented vehicle) accidents and in determining the preventability of collisions. Ensure that accident and violation reports are promptly and properly submitted in accordance with requirements of section 5.9 (24 hours for routine accident reports, same day for alleged violation reports, and **immediately** for accidents involving commercial motor vehicles).
- 6) Be sure that the proper preventive maintenance program is followed and permanent records are kept on each vehicle.
- 7) Be sure that employees operating company equipment understand the company's policy with regard to safety, and that their employment is dependent on their safe driving record.
- 8) Verify that the Local DOT Coordinator, Drilling Department Manager, or other person designated by the Branch Manager, is maintaining compliance with requirements as specified in the DOT Federal Motor Carrier Safety Regulations (available on the web at www.fmcsa.dot.gov).
- 9) Report any deviations from program requirements to the Branch Manager so the Branch Manager may initiate appropriate corrective action.

5.1.4 Local DOT Coordinator

At each ATC location that maintains a Drilling Department, the Drilling Department Manager (or other person designated by the Branch Manager) shall act as DOT Coordinator for the office. The primary duty of the DOT Coordinator is to ensure that all drill rig and truck drivers are trained and perform their driving duties within the criteria established by the Department of Transportation. Specifically, the DOT Coordinator's duties include the following:

- 1) Maintain driver qualification files for all DOT drivers and forward copies of all driver information to the CDRM. (Note: J. J. Keller & Associates sells driver qualification forms, logbooks and many other


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documents to simplify the compliance process. Their web site is www.jjkeller.com.)

- 2) Report all accidents and alleged violations to the Corporate Director of Risk Management (CDRM) and safety officer in accordance with requirements of section 5.9 (24 hours for routine accident reports, same day for alleged violation reports, and **immediately** for accidents involving commercial motor vehicles). Submit appropriate reports to state/federal DOT officials regarding DOT reportable accidents. Maintain an “accident register” as defined in 49 CFR 390.5.
- 3) Monitor and audit the driver’s hours of service to ensure employee compliance with 49 CFR 395 of the Federal Motor Carrier Safety Regulations.
- 4) Ensure that daily pre- and post- trip inspections are conducted on all trucks and that record of such are kept on file.
- 5) Ensure that routine maintenance is conducted on all trucks and records are kept.
- 6) Ensure that the drivers are undergoing regular DOT physicals and annual reviews on a systematic basis, and driver qualification files are kept current.
- 7) Assign a designated and qualified driver trainer to oversee initial orientation and training for all new drivers of straight trucks, tractor-trailers, drill rigs and other commercial motor vehicles as defined in Section 5.2.6.
- 8) Conduct check rides or in-vehicle training with any accident or violation repeaters to address any attitude or performance problems.

5.1.5 Employees

- 1) The use of a company vehicle is a privilege and with that privilege comes the responsibility to read, understand and follow the requirements of the Vehicle Safety and Policy Manual, and to follow all company rules and driving laws.
- 2) Persons who are Authorized Drivers as defined in section 5.2.1 of this Manual, or who drive personal vehicles on company business, shall:

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– Report all accidents as soon as practicable (within one hour) of occurrence per section 5.9.1 and, for commercial motor vehicles, there are additional requirements per section 5.9.3.

– Authorized Drivers shall report ANY alleged traffic violations on the day of occurrence, in accordance with requirements of section 5.9.2. This includes ANY alleged violations occurring at ANY time, regardless of whether the occurrence takes place on or off the job, and regardless of who owns the vehicle.

- 3) Persons who drive company vehicles shall conduct daily or periodic vehicle inspections, and maintain vehicles, in accordance with requirements of section 5.10. Log vehicle use in accordance with section 5.8.

5.2 Driver Qualification Criteria


The following criteria will be used by ATC in determining an employee's qualifications to drive a company vehicle (or rented vehicle). The Motor Vehicle Record Check and Driver Disqualification Procedure described in sections 5.2.1, 5.2.2 and 5.2.3 apply to all ATC drivers of company vehicles (or rented vehicles) while the criteria described in section 5.2.4 apply only to Commercial Motor Vehicle (CMV) drivers. The term "CMV drivers" is defined in section 5.2.4

5.2.1 Authorized Drivers

No person may operate a company vehicle (or rented vehicle) unless they are an authorized driver. The term "authorized driver" means an employee who conforms to the driver qualification criteria established in this section, and to whom permission to drive a company vehicle (or rented vehicle) is given by an ATC manager.

The term "company vehicle" means any vehicle owned by ATC or any vehicle rented by ATC for company business. It is necessary to define rented vehicles as company vehicles because ATC's commercial auto insurance covers such vehicles.

Non-employees (such as client or vendor representatives) who can demonstrate a legitimate business need to operate a company vehicle (or rented vehicle) may be classified as authorized drivers. However, such persons must conform to ATC's driver qualification criteria and receive written permission from an ATC manager to operate a company vehicle (or rented vehicle).

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Written permission for non-employees shall include an effective date and an expiration date for a period not to exceed one year. Written permission may be renewed for subsequent one-year periods if the non-employee can demonstrate a continuing business need to operate a company vehicle (or rented vehicle), and the non-employee is determined to be in conformance with driver qualification criteria.

Employee friends and family members (including spouses) are not authorized to operate company vehicle (or rented vehicles).

Employee driving may be categorized in one of three ways:

Category 1 – Driving is an “essential” job function (i.e., if the person is unable to drive a company or rented vehicle they are incapable of doing their job). Generic examples of jobs that may fit this category include drillers, drill helpers, materials technicians and outside salespersons.


Category 2 – Driving is an “occasional” job function (i.e., if the person is unable to drive a company or rented vehicle they may still be capable of doing their job but may require some accommodation such as riding as a passenger with others, using public transportation, hiring taxicabs, etc.). Generic examples of jobs that fit this category may include Branch Managers, Corporate Department Managers, technical professionals, and inside salespersons.

Category 3 – Driving is not a job function (i.e., if the person is unable to drive a company or rented vehicle it will not affect their job because they are not expected to drive on company business). Generic examples of jobs that fit this category may include front office receptionists, laboratory workers and office administrative staff.

5.2.2 Motor Vehicle Record (MVR) Check

If an employee will be driving a company vehicle or rented vehicle their employment may depend upon their safe driving record. Therefore, ATC will conduct a review of past motor vehicle accidents and violations, and the employee’s driver’s license. Note that these and similar documents are confidential employee records and must be kept locked in a file cabinet or office when not in use. Consult with the Human Resources department for questions regarding proper handling of employee records.

Initially, a photocopy of each new employee’s license shall be obtained and kept on file. A visual check of the license should be made to ensure that it is current and to note any restrictions (glasses, etc.).

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Prior to employment of any person who will drive a company vehicle or rented vehicle, the Branch shall obtain a motor vehicle record (MVR) for that person. If driving is an “essential” job function (Category 1 driver) when you make an offer of employment, you must **state in the offer letter that employment is contingent on passing the company’s MVR requirements.**


There is a special offer letter available for this purpose at the Branch Manager/Administrator section of the Human Resources web page. If driving is an “occasional” job function (Category 2) or is “not” a job function (Category 3) there is no special offer letter but you must inform the person in writing (memo, email or other means) of the driver Category to which they have been assigned.

The Branch shall obtain an MVR at its own expense or shall request that applicants seeking employment provide ATC with an MVR that is current within 30 days. The applicant should contact the State Department of Motor Vehicles to obtain the MVR. The cost is typically less than \$10. In most instances you will probably want to order MVRs from ATC’s third party provider of MVRs. Refer to the Employee Health and Safety web page for details, or contact ATC’s Director of Risk Management for assistance.

If an employee drives a commercial motor vehicle (as defined in section 5.2.4) the Branch shall obtain an MVR annually as required by DOT regulations. Contact the Director of Risk Management for assistance in ordering these MVRs.

In the absence of a regulatory requirement, the corporate office may annually or more frequently obtain MVRs for all authorized drivers, or a chosen percentage of authorized drivers. Additionally, the corporate office may obtain MVRs or conduct other investigations relating to specific individuals as necessary to ensure compliance with the Vehicle Policy Manual.

Prior to obtaining an MVR, the branch must have the employee or prospective employee read and sign the Authorization, Consent and Disclosure forms in Appendix 30-2. (Note: An MVR is considered a “consumer report.” Consumer reports are regulated under the Fair Credit Reporting Act. These forms are necessary to assist ATC in complying with the Act). In the event an employee refuses to execute the Authorization, Consent and Disclosure, they will be ineligible to drive an ATC vehicle.

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Motor Vehicle Records can provide valuable data. Most important, they will verify that our drivers, or applicants, have current and valid operator's licenses, and indicate any convictions for violation of motor vehicle laws.

It is recognized that Motor Vehicle Records will vary by state and are dependent upon traffic enforcement and the effectiveness of the accident and violation reporting system. However, such weaknesses are usually faults of omission. ATC may question the validity of a clear driving record, but a bad record is generally an indication of poor driving habits.


MVRs are generally reliable but may also contain errors. Before taking permanent action based on an MVR, ATC should provide the affected person the opportunity to verify the accuracy of the MVR, and/or correct any errors.

ATC reserves the right to refuse to hire, or to deny or revoke driving privileges for any person that has a questionable driving record. If the MVR does not meet ATC criteria the Branch should not proceed with the hiring process. Consult with Human Resources or the Corporate Director of Risk Management for further guidance.

5.2.3 Types of Violations

Violations vary in significance and are of five types:


- 1) **MOVING VIOLATIONS** are basic traffic offenses (see examples):
 - *Exceeding the posted speed limit.*
 - *Failure to stop at traffic signal or stop sign.*
 - *Improper lane change.*
- 2) **STATUTORY VIOLATIONS** reflect moral hazards and are generally licensing or registration offenses (see examples):
 - *Driving after a license has been denied.*
 - *Operating an unregistered vehicle.*
 - *Using false registration or license.*
 - *Driving while license is under suspension.*
 - *Misrepresentation to obtain a driver's license.*

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- 3) **MAJOR VIOLATIONS** are serious convictions which indicate a disregard for public safety (see examples).
- Driving while intoxicated or impaired (DUI/DWI) due to alcohol or drugs.
 - Reckless driving resulting in bodily injury or property damage.
 - Hit and run.
 - Negligent homicide.
 - Speed Racing.
- 4) **CAPITAL VIOLATIONS** reflect severe moral hazards, and are felonies (see examples):
- Murder or assault with a motor vehicle.
 - Theft of a motor vehicle and related offenses.
 - Vehicle used in connection with any felony.
- 5) **DOT DISQUALIFYING OFFENSES** refer to **convictions** or forfeiture of bond or collateral upon a charge of a disqualifying offense, occurring **while the driver is on duty**, as defined in 49 CFR 391.15. (Refer to the regulation for specific details and disqualification periods.) DOT disqualifying offenses include:
- *Driving a commercial motor vehicle (CMV) while under the influence of alcohol as defined by state law, or with alcohol concentration = or > 0.04%.*
 - *Refusal to undergo testing for alcohol or drugs in connection with operation of a CMV.*
 - *Driving a CMV under the influence of Schedule I controlled substances, an amphetamine, narcotic drug or formulations or derivatives of amphetamines and narcotic drugs.*
 - *Transportation, possession or unlawful use of substances described above.*
 - *Leaving the scene of an accident while operating a CMV.*
 - *A felony while operating a CMV.*
 - *Violating an "out of service" order.*

5.2.4 ATC MVR Criteria

- 1) No one under the age of 18 shall be allowed to drive any company vehicle (or rented vehicle). Only employees of 21 years of age or older

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shall be allowed to drive vehicles with a gross vehicle rated weight of 10,001 pounds or more.

2) ATC shall disqualify (in accordance with section 5.2.3) a person from operating a company vehicle (or rented vehicle) if a MVR check indicates:


- One or more statutory, capital or major violations within the past 36 month period, or:
- Any other offenses as outlined below, in the magnitude stated.
 - ✓ Three or more moving violations with any vehicle within the past 12-month period.
 - ✓ Five or more moving violations with any vehicle within the past 36-month period.
 - ✓ Two or more preventable accidents in a company vehicle (or rented vehicle) within the past 12-month period.
 - ✓ Three or more preventable accidents in a company vehicle (or rented vehicle) within the past 36-month period.

In the event of an alleged violation that has not been adjudicated, ATC Management will review the available facts. If a reasonable interpretation of the facts indicates that adjudication would likely result in a conviction or confirmation of the offense, ATC will treat the allegation as if it had been confirmed.

- 3) ATC shall not allow any employee to operate a company vehicle (or rented vehicle) if ATC's insurance company has excluded the employee from coverage under the commercial auto insurance policy.
- 4) ATC shall not allow any employee to operate a CMV if the employee has committed a DOT Disqualifying Offense, unless the required period of disqualification has passed, and the employee has satisfied all other regulatory requirements relating to the disqualification (see 49 CFR 301 through 399, especially 391.15).

5.2.5 Driver Disqualification Procedure

Any ATC employee found in violation of the criteria outlined in Section 5.2.4 will be placed on a four (4) month probationary period. The employee's supervisor must document the reason for disqualification by using the "Waiver of Driving Privilege" form (see Appendix 30-3), which will then be placed in the employee's personnel file. The supervisor must also consult with the appropriate Human Resources representative to ensure that requirements of Appendix 30-2 relating to rights of the

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employee have been met (see “A Summary of Your Rights Under The Fair Credit Reporting Act”).

During this probationary period, the employee shall not drive any company vehicle (or rented vehicle) and must meet the following criteria:

- Must satisfy any court-ordered and ATC requirements arising from the motor vehicle violations.
- Must not have any additional violations.
- Must successfully complete a web-based, defensive driving skill course, which may be paid for by ATC. (This requirement is not applicable if the employee has completed an equivalent course within the past 12 months.)
- Must undergo a personal interview with the Director of Risk Management and appropriate senior manager.


At the end of the probationary period, if all of the above criteria are met and the employee continues to meet all other qualification requirements of this Manual, the employee will again be eligible to drive a company vehicle (or rented vehicle). If the above criteria are not met, the employee may be permanently disqualified from driving an ATC vehicle. An MVR check will be conducted at the end of the probationary period to verify compliance.

An ATC employee is allowed one probationary period. If, after probation, driving status is regained and the employee again violates the MVR criteria, the employee’s company vehicle (or rented vehicle) driving privilege shall be permanently revoked.

Note: ATC drivers of commercial motor vehicles as defined in the following section must also comply with criteria per the Federal Motor Carrier Safety Regulations (FMCSR) as described in 49 CFR 391.15. Disqualification periods may last from six (6) months to an entire lifetime, depending on circumstances.

5.2.6 Commercial Vehicle Driver Qualification Files

If the MVR screen is acceptable, the next step in the Employee/Driver Qualification Process for drill rig, tractor-trailer or combination truck/trailer drivers involves the vehicle operator’s DOT qualification and testing.

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CAUTION: DOT regulations are very complex and cannot be fully represented below. Refer to DOT FMCS Regulations for further details and to ensure compliance.


The DOT regulates commercial motor vehicles. A Commercial Motor Vehicle (CMV) is defined as any self-propelled or towed vehicle used on a highway in interstate commerce that has a Gross Vehicle Weight Rating (GVWR) or Gross Combination Weight Rating (GCWR – for towed vehicles) of 10,001 pounds or more. All motor vehicles sold in the U.S. have a weight rating listed on the driver-side door or door jamb. Trailers are rated separately and evaluated in combination with self-propelled vehicles.

ATC must maintain driver qualification files and other records for each CMV driver, and ensure that the driver has completed a road test and written test. Additionally, with respect to a CMV having a GVWR or GCWR of 26,001 pounds or more, ATC must ensure that the driver has obtained a valid Commercial Driver's License (CDL) as specified in FMCSR Part 383.

It is the responsibility of each DOT Coordinator to ensure all applicable forms for the driver qualification files are properly completed. The original file should then be forwarded to the Corporate Director of Risk Management. A duplicate set of records should, likewise, be kept at each branch for ready reference.

Note that these and similar documents are confidential employee records and must be kept locked in a file cabinet or office when not in use. Consult with the Human Resources department for questions regarding proper handling of employee records. There are six steps involved in qualifying a new driver and putting that person on the road. These steps are spelled out in Part 391 of the regulations and require the following:

- The driver must properly and completely fill out an application for employment, including past driving history. (DOT auditors say that one of the most common findings of any DOT audit is incomplete employment applications and driving histories.)
- ATC must check out the applicant's previous employment references.
- ATC must check out the applicant's driving record and violations in the current and all prior states of residence and prior employers.

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- The driver must pass a driving (road) test. (Although this requirement is not applicable to drivers with a CDL, it is ATC's policy to provide all new drivers with a road test.)
- The driver must take a written exam. (This requirement not applicable to drivers with a CDL.)
- The driver must successfully pass the DOT physical exam (required every 24 months) and carry a medical examination certificate (driver card) issued by the examining physician. Drivers with a CDL must also pass an initial drug screen and participate in a random drug screening pool.


5.2.6.1 Application and Reference Review

As part of the employment application, CMV drivers must complete a driver application supplement, which is in addition to the normal ATC and lists all accidents and moving violations. This should, in turn, check out with the MVR review. Drivers must also list their reasons for leaving a previous employer and supply information on their past employers over the last ten (10) years (if the prospective employee has been driving that long).

The DOT Coordinator must check with the states and previous employers must be contacted within 30 days. Copies of this information must be kept in the driver's file. Refer to 49 CFR 391.23 to ensure that all requirements are met.

5.2.6.2 Road Test

It will be up to each Fleet Safety Coordinator to determine what to include in an employment driving test, as the content will vary depending upon the type of vehicle. DOT requires that, at a minimum, the prospective driver must satisfactorily demonstrate the following:

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- a. Pre-trip vehicle inspection
- b. Coupling/uncoupling (if applicable)
- c. Placing the vehicle in operation
- d. Proper operation of controls and emergency equipment
- e. Driving in traffic and passing other vehicles
- f. Turning
- g. Braking and slowing by means other than braking
- h. Familiarity with procedures for securing cargo
- i. Backing and parking

Specific DOT road test content is outlined in the "Record of Road Test" form.


Either the local DOT Coordinator or a designated driver trainer will conduct the driving test and will complete the "Record of Road Test" and "Certification of Road Test" to be placed in the driver qualification file.

5.2.6.3 Annual Review

49 CFR 391.25 states that the employer must annually review a CMV driver's record with the employee to ensure that the driver meets minimum requirements for safe driving and is not disqualified from driving per DOT or company guidelines. This is also an opportunity to discuss a driver's performance and driving record, and to take corrective action where needed.

The person conducting the review (typically the DOT Coordinator) must document the review in the driver file, in accordance with requirements of 49 CFR 391.25.

The regulations (49 CFR 391.27) also require drivers to furnish, at least annually, a record of any convictions or moving violations. If a driver has had no violations, he must so certify in writing and this is added to his driver file. Following this annual review, a copy of the violation and review record must be put in the driver qualification file.

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Additionally, company policy requires drivers to notify their supervisor of alleged violations as soon as practicable but in no event later than one hour after occurrence.

5.2.6.4 Medical Exam

DOT spells out driver physical requirements in minute detail in Part 391.41 of the regulations. Each CMV driver must participate in the ATC Medical Surveillance Program administered through Continuum Healthcare, which has been structured to satisfy DOT requirements.

DOT medical exams must be conducted on a pre-employment basis and at least every two years thereafter. Of course, many ATC personnel will receive an exam every year to comply with OSHA regulations. (If the driver holds a CDL, the initial medical exam will include a drug screen per Part 391 of the regulations.)


Following successful completion of the medical exam, the examining physician will issue a DOT wallet card to the driver and a copy to ATC. The copy must be filed in each driver's file.

If a person is impaired by injury or illness, the person may not be permitted to driver a commercial motor vehicle unless they are physically qualified, which includes having no loss of a foot, leg, hand or arm (unless granted a waiver); no impairment of the hand or finger which interferes with power gripping, nor of arm, foot or leg which interferes with the ability to perform normal tasks.

5.3 Authorized and Unauthorized Use

Company vehicles (or rented vehicles) are authorized for use in furthering the business interests of ATC and are not authorized for other purposes. At no time shall employees be permitted personal use of a company vehicle (or rented vehicle). If an employee engages in unauthorized use of a company vehicle (or rented vehicle), disciplinary action may be taken, up to and including suspension of driving privileges (probation), charging the employee up to \$1,000 for damages, and termination of employment.

Company vehicles shall be parked at the ATC parking lot at the end of each workday. Exceptions require advance approval of the Branch Manager. ATC expects Branch Managers to exercise great care in making exceptions because both the driver and the Branch Manager will be held accountable for unauthorized (e.g., personal) use of a company vehicle.

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Accountability means that both the driver and the Branch Manager will be subject to disciplinary action, up to and including termination of employment, for unauthorized use of the vehicle. Exception approvals involving business use of a company vehicle over a weekend shall require the prior approval of the Regional Vice President.

Company vehicles (or rented vehicles) shall not be used in Mexico unless and until the ATC branch operating the vehicle has contacted ATC's Risk Manager and the branch has purchased a local Mexican insurance policy covering the vehicle.

Company vehicles (or rented vehicles) shall not be used in Canada unless and until the ATC branch operating the vehicle has received written permission from ATC's Fleet Manager. (Written permission is a requirement of Canadian law due to the fact that the vehicle operator does not own the vehicle.)

5.4 Rental Vehicles


ATC maintains insurance coverage adequate for most circumstances involving business use of rented passenger vehicles. Therefore, employees may decline all insurance coverage at the rental counter for business use of passenger vehicles. Be sure to indicate the company name (ATC Associates) on the rental form so it is clear that this is a business rental, covered by ATC's insurance.

Trucks and heavy equipment may require special insurance coverages or limits. In most instances we can avoid paying daily insurance charges by providing the rental company with a certificate of insurance. For assistance, contact ATC's Risk Manager in advance of making a reservation for trucks and heavy equipment.

5.5 Employee Use of Personal Vehicles On Company Business

Employees who drive personal vehicles while conducting company business are subject to certain provisions and standards as described in this program and are also required to:

- Maintain personal automobile insurance coverage with limits that meet or exceed minimums required by law for the state in which the driver resides;
- Maintain a personal automobile insurance policy that provides coverage for use of the vehicle on company business. (It is strongly recommended that employees contact their personal insurance agent to verify that the employee's personal auto policy provides coverage for business use of the vehicle. **FAILURE TO NOTIFY THE AGENT AND CONFIRM THE COVERAGE COULD RESULT IN AN UNINSURED LOSS TO THE**

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EMPLOYEE. Don't let that happen. Most personal auto insurers expect that employees will do some driving for business reasons, and typically they do not charge additional premium for the exposure.);

- Maintain current state registration and vehicle inspection (if the state requires one); and
- Maintain the personal vehicle in safe operating condition.

ATC provides a mileage reimbursement to employees to cover the cost of insurance (and other costs) associated with use of personal vehicles on company business. The mileage reimbursement is based on guidelines and rates set by the Internal Revenue Service. (Guidelines are found in IRS publication 463, "Travel, Entertainment, Gift and Car Expenses".

Details are found in section 4 of the IRS Publication 463 on "car expenses" and "standard mileage rate." This is available on the web at www.irs.gov). The reimbursement rate varies from year to year and has historically been about 30 cents per mile. According to the IRS, this rate reflects operational costs such as depreciation or lease payments, maintenance and repairs, gasoline (including gasoline taxes), oil, insurance and vehicle registration fees.


Since the cost of personal auto insurance is included in the mileage reimbursement, it is necessary for the personal auto policy to respond to accidents involving the employee's vehicle. In the event of a collision, the employee would report the claim to their personal insurance agent to be processed.

If, at the time of the collision, the employee is operating the vehicle in compliance with the Vehicle Safety and Policy Manual, ATC will reimburse the employee for the out-of-pocket cost to pay the collision deductible, in an amount not to exceed \$1,000. If the other party is at fault, it is likely that the other party's insurance company will pay the deductible to the employee's insurer, who will then reimburse the employee. If any such reimbursement takes place, the employee must reimburse ATC for the deductible amount previously paid by ATC to the employee.

Motorcycles and other two-wheeled conveyances (e.g., bicycles) shall not be used for business purposes.

Refer to the ATC Travel Policy for additional details regarding insurance coverage for personal vehicles.

5.6 Employee/Driver Orientation and Training

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Once selected for employment, and prior to being assigned to use or operate any company vehicle (or rented vehicle), some form of initial orientation shall be conducted by the employee's supervisor to communicate basic company vehicular policy and procedure.

To supplement this review process, each driver shall be issued and sign to acknowledge receipt of a copy of this written program. They will then sign the "ATC Vehicle Policy and Agreement."

Each new ATC driver should be assigned to take a defensive driver-training course. ATC has access to a defensive driver-training course that can be taken interactively on the web. Contact the Corporate Director of Risk Management for further details.

For drivers subject to the DOT regulations (all CMV drivers), a copy of the Federal Motor Carrier Safety Regulations (FMCSR) should also be distributed and signed for by the employee. The J.J. Keller web site has ordering information for these handbooks (www.jjkeller.com).


The designated DOT driver trainer should be responsible for orientation of all new straight truck, tractor-trailer, and drill rig operators. This individual should command the respect of others, have a good driving record, and the ability to instruct in a stimulating manner. The orientation session should primarily focus on equipment familiarization, vehicle inspections, cargo handling, DOT regulations, emergency/accident investigation procedures, and defensive driving techniques.

5.7 General Safety & Security Requirements

Drivers must follow these safety requirements:

1. Check vehicle for obvious safety defects before driving.
2. Check the glove compartment to ensure that the vehicle has a current insurance identification card and accident reporting kit.
3. Wear safety belts.
4. Drive with lights on.
5. Obey traffic laws.
6. Substantially restrict (or eliminate) cell phone use while driving.

Studies have shown that the mental distraction of using a cell phone while driving substantially increases the risk of accidents. Hands-free devices

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aren't the answer because they don't reduce mental distraction. If the call is critically urgent, pull over to the side of the road.

If not critically urgent, allow the call to wait until you have reached your destination. For incoming calls, if you must answer, quickly ask the caller if you can call back when it is safe to pull over. **Bottom Line: ATC wants you to hang up and drive!**

7. Before fueling, turn off cell phone or place cell phone in vehicle. Electrical charges from operation of cell phones can ignite fuel vapors. To prevent static charge buildup remove portable fuel containers (e.g., gas can) from vehicle and place on ground before filling. Never fill a fuel container while it is sitting in the back of a pickup truck.
8. Drive defensively and don't tailgate.
9. Don't drive if impaired due to fatigue, illness, emotional state, prescription or illegal drugs, alcohol or other conditions.
10. Report any maintenance-related problems immediately.
11. Do not pick up hitchhikers or accept payment for passengers.
12. When the vehicle is unattended, remove or stow valuables out of sight, and lock the doors.
13. Avoid transporting DOT hazardous materials, flammable liquids or gases. If transport is unavoidable, use a DOT or UL approved container. No single container can be greater than 8 gallons (100 lbs. per container for compressed gases) or a total of more than 440 lbs. of hazardous material at one time. **Do not transport hazardous materials exceeding these amounts without first reading and complying with applicable regulations for transporting hazardous materials.**

Refueling tanks transported on ATC vehicles presents a special challenge. These tanks are commonly needed by ATC Drilling Division personnel to fuel equipment while working at job sites. The tanks range in capacity from 50-gallon to 118-gallon and are typically rectangular, square or L-shaped. According to federal regulations, tanks with a capacity of less than 119 gallons are considered to be "non-bulk packaging" (49 CFR 171.8).

There is an exception in 49 CFR 173.150(f)(2) that allows "non-bulk packaging" tanks to be used for "combustible liquids" (diesel fuel). The tank should be labeled "Diesel Fuel Only" and "Combustible. Note that the exception **does not** extend to "flammable liquids" (gasoline) and **tanks commonly used for this purpose do not meet regulatory requirements for transporting flammable liquids**, as indicated in 49 CFR 173.202.

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The USDOT Office of Hazardous Materials Exemptions and Approvals has issued an exemption (#E11911) to a manufacturer whose tanks are very similar to those in common use. The exemption allows refueling tanks supplied by this specific manufacturer to be used to transport gasoline, provided the user adheres to all terms of the exemption. The manufacturer is Transfer Flow, Inc. 1444 Fortress St., Chico, CA 95973. The phone number is 800.442.0056 and the website is www.transferflow.com.

If your equipment refueling needs require you to transport gasoline in containers larger than a standard 5-gallon gas can, the most cost-effective way to achieve regulatory compliance may be to purchase a tank from this company and follow the requirements of use as stated in the exemption.

It is possible that other manufacturers will have exemptions; however, you must confirm the exemption in writing for your specific tank before using the tank for transporting gasoline.

Except as noted above, any non-bulk packaging used to transport gasoline must be USDOT-approved for that purpose **and it must be removed** from the transport vehicle before its contents are unloaded.


5.8 Driving Logs

Drivers of all company vehicles must, each day, complete the Assigned Vehicle Daily Log (see form in Appendix 30-8).

As outlined in Part 395 of the FMCSR, any commercial vehicle driver operating his/her vehicle outside of a 100-air-mile radius of his/her office is required to maintain a daily log which details their hours of service.

The following are the hours of service limits, which must be observed in accordance with FMCSR Section 395:

- A maximum of 10 hours driving, after which a driver must have at least 8 consecutive hours off duty before they can drive again (Section 395.3[a]).
- A maximum period of 15 hours, after which a driver must have at least 8 consecutive hours of rest before they can again drive (Section 395.3[a]).
- A maximum of 60 hours on duty in any 7 consecutive days or, if working every day in the week, a maximum of 70 hours on duty in any 8 consecutive days. Once a driver reaches these limits, they cannot drive (Section 395.3[b]).
- If the driver operates within a 100-air-mile radius of his/her home office, it may be possible to exempt the driver from some logbook requirements. Refer to Section 395.1 for specific requirements. Before using this exemption, verify that it does not conflict with state/local requirements.

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- If the driver operates a CMV primarily in the transportation and operation of a groundwater well drilling rig, or transportation of construction materials and equipment, any period of 7 or 8 consecutive days may end with the beginning of any off-duty period of 24 or more successive hours. Refer to Section 395.1 for specific requirements. Before using this exemption, verify that it does not conflict with state/local requirements.
- The logs must be accurate, complete and in compliance with the above-stated limits. It is the DOT Coordinator's responsibility to ensure that all drivers understand logging procedures but it is ultimately the driver who is responsible for logging violations. Any citations and/or fines concerning hours of service violations are the responsibility of the driver.
- Each driver must retain in his possession while driving, complete carbon copies of logs for the previous eight days. Every seven days, the driver should forward the original log to the local DOT Coordinator. At the beginning of each month, the DOT Coordinator should send the original copies of logs for the proceeding month to the CDRM. Duplicate copies must be kept for six months in a file for each driver at each local office.

5.9 Vehicle Accident And Violation Reporting Procedures


The first step toward the prevention of vehicle accidents is the review of the company's policy with the driver during orientation. This should emphasize the driver's conduct at the scene of an accident and the proper steps to be followed. Basic procedures to follow when an accident occurs are outlined in the "Safe Driver Requirements" in Appendix 30-1.

The employee's supervisor should, likewise, review the "Accident Report Kit" with the individual. Copies of these kits must be in each ATC vehicle to aid the driver at the scene of an accident. Kits can be obtained through the Corporate Director of Risk Management.

5.9.1 Reporting an Accident

All accidents involving company vehicles, rented vehicles, or personal vehicles driven on company business, must be reported **within one hour** by the employee to their supervisor. The supervisor should ensure that the employee at the scene has obtained all appropriate information.

For local incidents, the Fleet Safety Coordinator or the supervisor may wish to respond to the accident to aid in the investigation process. A copy of the investigating police report should be obtained and made a part of the accident file. This should supplement the driver's Accident Report Kit

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information and narrative report. The reporting procedure varies depending upon who is at fault.


5.9.1.1 Basic Reporting Instructions

ATC personnel at the scene of an accident should **never admit fault**. The following steps should be followed:

- 1) Seek immediate medical attention, if injured.
- 2) If the accident involves a commercial motor vehicle as defined in section 5.2.6, notify the Corporate Director of Risk Management **immediately**. (Depending on circumstances, DOT may require drug or alcohol testing within two [2] hours of the accident. Immediate reporting is necessary to meet this time frame).
- 3) Obtain a copy of the police report (usually available within 72 hours) and submit to the Corporate Director of Risk Management.
- 4) Along with the employee, the supervisor should complete an "ATC Vehicle Accident Investigation Form" (see Appendix 30-4).
- 5) As soon as practicable, same day or within 24 hours, the investigation form must be forwarded to ATC's insurance company for any **company owned, leased or rented vehicle**. Start the reporting process by calling the insurance companies 1-800 claim line.

A copy must also be sent to the Corporate Director of Risk Management. If the police report is not immediately available, send the investigation form as required, and follow up later by sending the police report. (For **employee-owned vehicles**, the employee must notify the insurance company that provides his/her personal auto insurance, and provide the investigation form to the Corporate Director of Risk Management. For **rental vehicles** you must notify the rental company in addition to other notifications described above.)

- 6) If the ATC employee is injured, a worker's compensation "First Report of Injury" form must also be provided as indicated in section 51 of this manual.

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- 7) Determine from ATC's insurance company where to take the vehicle and how many estimates to obtain.

5.9.1.2 Special Reporting Instructions


Here are some special reporting instructions to follow after the insurance company has assigned an adjuster to the claim.

- 1) If the company vehicle is not drivable and it is essential that a replacement vehicle be obtained, ask the claim adjuster about rental reimbursement. Rental reimbursements from insurance companies are typically \$15-\$17 per day and rarely cover the full cost of the vehicle. However, the adjuster can provide the name of a rental company with whom they have negotiated preferred rates.
- 2) If you become aware that the other driver has not reported the claim to his insurance carrier, notify our insurance company claim adjuster of that fact.
- 3) If you become aware that the other party is uninsured or underinsured, notify ATC's insurance agent and the claim adjuster so that an uninsured motorist claim can be submitted to ATC's insurance carrier. This coverage may not be available in all states. Provide a copy of this notification to ATC's Corporate Director of Risk Management.
- 4) If another insurance company offers to pay a claim on behalf of ATC, consult with the Corporate Director of Risk Management before proceeding.

5.9.2 Reporting a Violation

If an Authorized Driver violates driving laws on or off the job, he or she may be disqualified from driving company vehicles (or rented vehicles). Therefore, it is necessary for an Authorized Driver to notify their supervisor as soon as practicable (**same day**) of receiving a written notice that alleges any moving, statutory, major, or capital violation and/or DOT Disqualifying Offense (see section 5.2.1 for detailed descriptions).

The purpose of this requirement is to allow ATC the opportunity to promptly determine if the violation will jeopardize the person's status as a qualified driver under ATC policy, and to make that determination before the next work shift in which the person is scheduled to drive a company

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vehicle (or rented vehicle). Since ATC policy does not discriminate between violations at work or away from work, it is necessary for the Authorized Driver to report violations occurring in any vehicle, not just company vehicles (and rented vehicles).

If the incident occurs after normal business hours, the initial report may be given via voicemail. As soon as practicable after providing verbal notification, but before driving a company vehicle (or rented vehicle) again, the Authorized Driver must provide his/her supervisor with a copy of the violation notice, and await approval from the supervisor before driving a company vehicle (or rented vehicle).

The supervisor must notify the Legal Department (Corporate Director of Risk Management) as soon as practicable (**same day**) of receiving a report of an alleged violation, and prior to allowing the employee to drive a company vehicle (or rented vehicle) on the next work shift. The supervisor shall consult with the Legal Department to determine if the alleged violation will affect the person's status as an Authorized Driver.


The supervisor shall not allow the person to drive a company vehicle (or rented vehicle) until that determination has been made. If it appears that a person will be ineligible to drive as a result of a reported violation, the Corporate Director of Risk Management will consult with the Human Resources Department before issuing a decision.

5.9.3 DOT Reporting Accidents

In addition to reporting motor vehicle accidents to appropriate state and local departments and the insurance company, the FMCSR may require motor carriers to submit an accident report for commercial motor vehicles subject to the DOT regulations. **The DOT Coordinator must ensure that state and federal reporting requirements are met for any accident involving a CMV. Consult with the Corporate Director of Risk Management prior to submitting accident reports.**

The DOT Coordinator is responsible for maintaining an accident register for a period of one year following any accident involving a CMV. The accident register must contain the following information:

1. A list of all accidents
2. Date of each accident
3. City or town closest to where accident occurred, and State

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4. Driver name
5. Number of injuries
6. Number of fatalities
7. Whether hazardous materials, other than fuel from tanks of motor vehicles involved in the accident, were released
8. Copies of all accident reports required by State or other governmental entities, or insurers

5.9.4 Accident Review Procedures

After every accident, the local Fleet Safety Coordinator, DOT Coordinator, or the employee's supervisor are responsible for reviewing the incident, in consultation with the Corporate Director of Risk Management, to identify the specific root causes responsible and to determine corrective measures to be taken to prevent a similar occurrence. The reviewers should avoid conclusions such as "the driver needs to be more safety conscious." Broad statements such as this do not address the root causes of accidents.

Reviewers should search for details that better reflect root causes such as "driving too fast for conditions because he didn't plan ahead and allow enough time to get to the job site."


All accidents should be categorized as "preventable" or "non-preventable." The preventability decision will be a part of the employee's personnel file. A driver will be advised in writing of the decision, how the accident could have been prevented and, if applicable, what disciplinary action will be taken.

5.9.4.1 How to Determine Vehicle Accident Preventability

Most accidents are preventable. A preventable accident is one in which the driver in question failed to do everything that could be reasonably expected to be done to prevent it. The key to this definition is the word "reasonable."

The standard accident prevention formula should be applied to every accident to determine if the driver appropriately applied the proper steps in trying to prevent the accident.

To do this, complete details are needed of what the driver saw, when it was seen, and whether action taken was appropriate to the

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circumstances. If the driver did not see or recognize the hazard on a timely basis, information should be developed as to why the hazard was not recognized in time or as to why the appropriate action was not taken to prevent the accident.

The decision of preventability should be made on the basis of what the company driver did or did not do to prevent the accident.

Evidence of a violation of the law is a clear-cut indication of the preventability of the accident. However, the absence of any violation does not make the accident non-preventable.


Actions taken by other drivers should have no bearing on the preventability on the part of the ATC driver. Even though the other driver may have violated a traffic law or may have been legally wrong, this should not influence the preventability decision with respect to actions of ATC's driver.

The Fleet Safety Coordinator or supervisor should interview the involved driver as quickly as possible after the accident. The driver's account of the accident should be in writing and signed by the driver. This will help to avoid the driver's account becoming distorted and changed at a later date.

During the interview, the interviewer should attempt to learn from the driver what, if anything, the driver thinks could have been done to prevent the accident. Replies such as "I guess I could have slowed down prior to entering the intersection" is an indication that the driver could possibly have prevented the accident. However, written documents should stick to the facts and avoid drawing conclusions about who was at fault.

The individual making the investigation must bear in mind that information developed during the investigation is subject to the discovery procedure by the plaintiff's attorney should a civil action result. The Fleet Safety Coordinator or supervisor may want to coordinate the investigation with ATC's attorneys and Corporate Director of Risk Management to avoid jeopardizing the company's position in any civil action that might result.

Every reasonable effort should be made to verify the driver's account of the accident. Such steps could include comparison of the driver's statement with police report, witness statements, and management findings at the scene of the accident.

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If the driver alleges that a mechanical condition of the vehicle caused or was a contributing factor to the accident, the vehicle must be inspected by a qualified mechanic as quickly as possible and before the alleged defective part has been replaced or disturbed. Defective parts could be important to the recovery of claim costs and should be retained in accordance with instructions from ATC's legal department.

Refer to Appendix 30-4 for a more detailed "Guide to Determining Motor Vehicle Incident Preventability."

5.9.5 Post Accident Drug/Alcohol Test


Employees shall participate in post-accident drug/alcohol testing if required by law or company policy. By law, persons who are required to have a CDL while operating a company vehicle (or rented vehicle) shall receive post-accident testing within two hours following an occurrence on a public road, when the occurrence meets the requirements described in 49 CFR 382.303.

Those requirements include any incident involving loss of human life, or any incident in which the driver receives a citation for a moving violation and (1) there is vehicle damage requiring towing of any vehicle, or (2) bodily injury requiring medical treatment away from the accident scene. Note that the term "safety sensitive function" as used in that section of the CFR has a particular meaning, which is defined in 49 CFR 382.107.

Furthermore, no driver required to take a post-accident alcohol test per requirements of 49 CFR 392.303 shall use alcohol for eight hours following the accident, or until he/she undergoes a post-accident alcohol test, whichever comes first.

Failure to make a good-faith effort to participate in post-incident drug and alcohol testing shall result in disciplinary action up to and including suspension of driving privileges or dismissal.

Consult with the Human Resources Department or Legal (Risk Management) Department for details of company drug/alcohol testing policy.

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5.10 Vehicle Maintenance and Inspection

5.10.1 Commercial Motor Vehicles (GVWR or GCWR of 10,001 lbs. or more)

The Federal Motor Carrier Safety Regulations (FMCSR) require that a driver be satisfied that the motor vehicle is in safe operating condition before he/she operates it. This generally requires that the driver conduct a pre and post-trip inspection of his vehicle on a daily basis for vehicles subject to DOT regulations.


A driver's post-trip responsibilities require preparation of a vehicle inspection report after each day's work and each vehicle drive (see Appendix 30-6). In addition, drivers are required to note any defects or problems, which could affect safe operation, and then sign the report. The report should be submitted to the DOT Coordinator and a copy forwarded by the DOT Coordinator to the mechanic or repair shop, as appropriate.

As part of the pre-trip inspection rules, the driver should review the last vehicle inspection report to ensure all defects noted by the previous driver have been repaired. Both the mechanic and the new driver must sign off on the work before the vehicle can be dispatched. In addition, a copy of the latest inspection report must remain within the vehicle. The DOT Coordinator is required to keep the original copy of each report and certification of repairs for at least three months in each vehicle's maintenance file.

In addition to auditing the above vehicle inspection reports, the Fleet Safety Coordinator should periodically check the maintenance files on the vehicles to ensure the vehicles are being serviced and repaired on a systematic or scheduled basis as outlined in Section 396.3 of the FMCSR.

The Fleet Coordinator must retain records on each fleet vehicle, which include the following information:

- 1) An identification of the vehicle including company number (if so marked), make, serial number, year and tire size.
- 2) A means to indicate the nature and due date of the various inspection and maintenance operations to be performed.
- 3) A record on inspection, repairs, and maintenance indicating their date and nature.
- 4) A lubrication record.

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The record required by the section must be retained at the local office for a period of one year and for six months after the vehicle leaves the motor carrier's control.

Note: Since July 1990, all commercial vehicles operating in interstate commerce must be inspected annually. Periodic inspections may consist of state mandatory inspections, roadside inspections conducted by federal or state officials, or inspections performed by a commercial garage using certified personnel.

It will be the responsibility of the DOT Coordinator to ensure that the individuals conducting the inspections meet the minimum federal inspector qualification requirements. An inspection report must be retained for one year from the date of each inspection where the vehicle is housed or maintained. An original or copy of the annual inspection report must also be carried in the vehicle.

5.10.2 Non-Commercial Motor Vehicles (GVWR of 10,000 lbs. or less)


For passenger cars, pick-ups and vans, each assigned vehicle operator will be responsible for the unit's maintenance and repair. If the vehicle is unassigned, the Branch Manager must designate a person responsible for maintenance and repair.

Vehicles should be maintained in accordance with the Donlen Preventative Maintenance Program, or if the vehicle is not part of the Donlen Program, follow the manufacturer's suggested guidelines. A record of the service and repairs should, likewise, be maintained in the rear of the owner's manual.

Prior to the start of each day's use, the operator should do a basic inspection to determine fluid levels, tire pressure, cleanliness, etc. This is especially important prior to long trips.

The drivers should also perform a monthly inspection of their vehicles utilizing the monthly Vehicle Condition Report (see Appendix 30-7). The complete reports should describe the condition of the auto's critical components (i.e., brakes, lights, horn, tires, steering, etc.). Copies of the reports should be reviewed by the department supervisor and placed in a central file for future reference.

Any vehicular problems detected during a daily or monthly inspection should be reported to the appropriate supervisor and corrected as soon as

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possible. It is the operator's responsibility to schedule maintenance for the vehicle. If necessary, the vehicle will be removed from operation until repairs have been completed.

5.11 Fleet Management

(THIS SECTION RESERVED FOR PETER POMPONI)

6.0 References

49 CFR 171 - 173

49 CFR 301 – 399



Appendix 30-1

SAFE DRIVER REQUIREMENTS

- **Driver Operating Instruction**

Any company vehicle (or rented vehicle) either issued to you or allowed to be used by you, is with the understanding that you will use common sense in your operation and maintenance of the unit.

It is your responsibility to know the motor vehicle laws in your areas where you drive and to observe these laws. There is never an excuse for the operation of a company vehicle (or rented vehicle) in an unsafe or unlawful manner.

You, the employee to whom the vehicle is assigned, will be held responsible for any damage to the vehicle in the event you have permitted it to be used in violation of the limitations outlined below.

Employees operating their own vehicles, company vehicles (or rented vehicles) for business purposes will be financially responsible for any traffic violations/citations received, including parking tickets. If an ATC vehicle is impounded as a result of illegal use, the driver is responsible for reimbursing ATC for all costs associated with vehicle redemption or replacement.

- **Personal Use**

Personal use of company vehicles (or rented vehicles) is not permitted. If an employee engages in unauthorized use of a company vehicle (or rented vehicle), disciplinary action may be taken, up to and including suspension of driving privileges (probation), charging the employee up to \$1,000 for damages, and termination of employment.

- **Securing the Vehicle**

The ignition keys should never be left in an unattended vehicle. Vehicles when unattended should be parked in a secure area and kept locked.

- **Passengers**

Business associates, relatives and friends may be carried as passengers in a company vehicle (or rented vehicle) when their presence is incidental to, or a part of, activities that further the business interests of ATC. However, operators are strictly prohibited from picking up hitchhikers or other strangers at any time.

- **Alcohol/Drugs**

Alcohol or drugs are prohibited from ATC property. Driving any vehicle for company purposes under the influence of alcohol or drugs is absolutely prohibited. Violation of this policy is grounds for immediate termination.

- **Seat Belts**

Seat belt use is required for the driver and all passengers in any vehicle used for company purposes.

- **Cell Phones**

Substantially restrict (or eliminate) use of cell phones while driving. See Section 7.0 for further details.

- **If An Accident Occurs**

Your company vehicle (or rented vehicle) is insured for liability and physical damage. Report any vehicle accident to your manager within one hour of occurrence (or immediately if the accident involves a commercial motor vehicle), as explained in section 9.0.

Your responsibility at the accident scene also includes the following:

1. Stop immediately: Seek medical attention if anyone is injured.
2. Notify the police and your manager as soon as possible of the accident.
3. Obtain the names and addresses of all witnesses and injured persons. If a witness tries to leave the scene, write down a description of the vehicle (make, model and color) and his license plate number and the issuing state.
4. Never make an admission of guilt or take any blame for the accident. Never sign an Exoneration Card and don't apologize or try to settle an accident at the scene.
5. Do not discuss the accident with anyone except a representative of ATC, the liability insurance carrier, or proper authorities. If anyone else asks for details, be polite, but firmly refuse to discuss the accident with them.
6. If you strike an unattended vehicle and cannot find the driver, you are required by law to leave a note on the vehicle with your name, address, and phone number.
7. You should fill out your Accident Report Kit at the scene of the accident while the details are still fresh in your mind.
8. Familiarize yourself with state and local laws regarding the filing of an accident report and comply with the law.

Each accident will be investigated with a report made to top management as to whether the incident could have been prevented. The decision will be communicated to the driver. Any violations of traffic laws will be cause for disciplinary action as outlined in the ATC Vehicle Safety and Policy Manual.

- **Emergency Equipment**

Subject to the discretion of the Branch Manager, company vehicles should be equipped with emergency equipment appropriate to the use of the vehicle. For example, it may be appropriate for drill rigs and support trucks to have the items listed below. Sedans and pick-up trucks used primarily for transportation around-town may need fewer items, based on the age of vehicle and its intended use:

1. First aid kit (10 unit)
2. Bloodborne Pathogen Kit
3. Reflective triangles (3)
4. A, B, C-rated fire extinguisher (21/2 lb. for passenger vehicles or small pick-up trucks, 5 lb. for drill trucks and support trucks)

- **Vehicle Inspection and Maintenance**

It is each assigned vehicle operator's responsibility to see that minimum vehicle maintenance meets the manufacturer's suggested guidelines as outlined in each vehicle Owner's Manual. The department manager should maintain a record of all service and repairs performed on the vehicle. These records should be kept with the vehicle. The vehicle driver is responsible for reporting all maintenance problems to his/her manager. The vehicle driver is also responsible for performing a visual safety inspection of their vehicle prior to starting for the day. Items to be checked should include:

- Lights
- Horn
- Turn signals
- Brake lights
- Fluid levels
- Tire pressure and condition
- Adjustment of mirrors
- Windshield wipers

- **Driver Record Checks**

Due to the liability exposures involved, management reserves the right to conduct a background check into each driver assigned to use any company vehicle (or rented vehicle). Motor Vehicle Record (MVR) checks may be obtained initially, annually, or more frequently thereafter on all company drivers. Drivers may be disqualified from operating a company vehicle (or rented vehicle) and may be dismissed if there are any major convictions (DUI/DWI, reckless citation, etc.) or an excessive number of lesser violations and/or accidents (see Section 2.2 in the ATC Vehicle Safety and Policy Manual).



Appendix 30-2

ATC VEHICLE POLICY AND AGREEMENT

The following policies apply to drivers of company owned, leased, rented, and private vehicles driven on company business. Violations of these policies may result in disciplinary action, up to and including suspension of driving privileges (probation), charging me up to \$1,000 for damages, and termination of employment. In the event of an alleged violation that has not been adjudicated, I understand ATC may take disciplinary action if a reasonable interpretation of the facts, by ATC's MANAGEMENT, indicates that adjudication would likely result in a conviction or confirmation of the offense. I authorize ATC to deduct amounts owed from my paycheck if I have not paid ATC within 10 days of invoice.

The following are considered violations of company policy:

1. Operating a company (or rented) vehicle for any personal and/or non-company activity without the written consent from management.
2. Driving while under the influence of alcohol or drugs.
3. One statutory, major, or capital violation while driving any vehicle within the past three-year period.
4. Three moving violations with any vehicle within the past 12-month period.
5. Two or more preventable accidents in a company (or rented) vehicle within the past 12-month period.
6. Five moving violations with any vehicle within the past 36-month period.
7. Three or more preventable accidents in a company (or rented) vehicle within the past 36-month period.
8. Leaving the scene of any accident without exchanging information with the second party and/or police.
9. Failure to report, within one hour, any accident in which a company vehicle, rented vehicle (or personal vehicle operated on company business) is involved, regardless of how minor.
10. Failure to report, same day, any alleged violation of driving laws (citation) occurring at any time (on or off the job) and in any vehicle (employee-owned, borrowed, rented or company-owned) per Section 5.9.2.
11. Permitting any unauthorized, non-employee use of company (or rented) vehicle.
12. Failure to utilize seat belts.
13. Committing a DOT Disqualifying Offense or failing to comply with DOT regulations in connection with the operation of a Commercial Motor Vehicle.
14. Any other requirements specifically stated in the ATC Vehicle Safety and Policy Manual.

Employee Agreement

I have read the ATC Vehicle Safety and Policy Manual (including Safe Driver Requirements in Appendix A) and the above policies and I understand completely. I will follow these policies at all times without exception. I understand my driving privileges may be suspended, my job may be terminated and damages of up to One Thousand Dollars (\$1,000.00) imposed on me, if I fail to abide by the policies.

Signed: _____

Date: _____

Print Name

ATC Office

*Drivers License No.

Manager's Signature

State Date of Birth

Employee ID # Driver Category (1, 2 or 3)



Appendix 30-3

WAIVER OF DRIVING PRIVILEGE

According to our records _____
is in violation of the ATC Vehicle Safety and Policy Manual. Specifically, the following
violations have been noted:

Based upon these violations, the following action has been taken (check the appropriate box):

- ☐ The above-named employee shall not operate any vehicle owned by ATC and/or any
ATC subsidiary for a period of four months beginning _____
(today's date)
- ☐ The above-named employee is permanently suspended from future operation of any
vehicle owned by ATC and/or any ATC subsidiary.

The employee may reinstate his/her driving privilege following the four-month probationary
period by meeting the following criteria.

1. Satisfy any court-ordered and ATC requirements resulting from motor vehicle
violations,
2. Have no new violations,
3. Successfully complete a defensive driving skills course selected by ATC, and
4. Undergo a personal interview with the Director of Risk Management and appropriate
senior manager.

If ATC's insurance carrier excludes the employee from coverage under the commercial auto
insurance policy, reinstatement may not be an option.

I understand and will comply with the above statement.

Employee Signature *Office/Division* *Date*

Manager's Signature *Date*

Return original copy of this document to the Corporate Director of Risk Management



Preventable ☐ Non-Preventable ☐

Appendix 30-4 Vehicle Accident Investigation Report

Mark Type Incident:

- ☐ Employee Injury / Illness (WC)
☐ Auto Accident (AL&APD)
☐ Damage to Others or Others Property (GL)
☐ Damage to Owned/Leased Property (Prop)
☐ Professional Liability (E&O)
☐ Environmental Release/Spill
☐ Near Miss

Mark Project Description:

- ☐ Petroleum (Retail)
☐ Petroleum (Upstream)
☐ Petroleum (Downstream)
☐ Alcoa
☐ COP.
☐ Other(List): _____
☐ Other(List): _____

BRANCH: _____ DEPT.: _____ DATE: _____

EMPLOYEE'S / CLAIMANT'S NAME: _____ POSITION: _____

EMPLOYEE NUMBER: _____ SUPERVISOR'S NAME: _____

DATE OF ACCIDENT: _____ TIME OF ACCIDENT: _____ PROJECT NAME: _____

TASK BEING PERFORMED WHEN ACCIDENT OCCURRED: _____

NAME(S) OF WITNESS (ES): _____

FIRST-AID GIVEN? ☐ MEDICAL TREATMENT REQUIRED? ☐ IF YES, WHERE WAS PERSON SENT FOR TREATMENT? _____

List specific Body Part(s) Affected? _____

DESCRIBE HOW THE ACCIDENT OCCURRED: _____

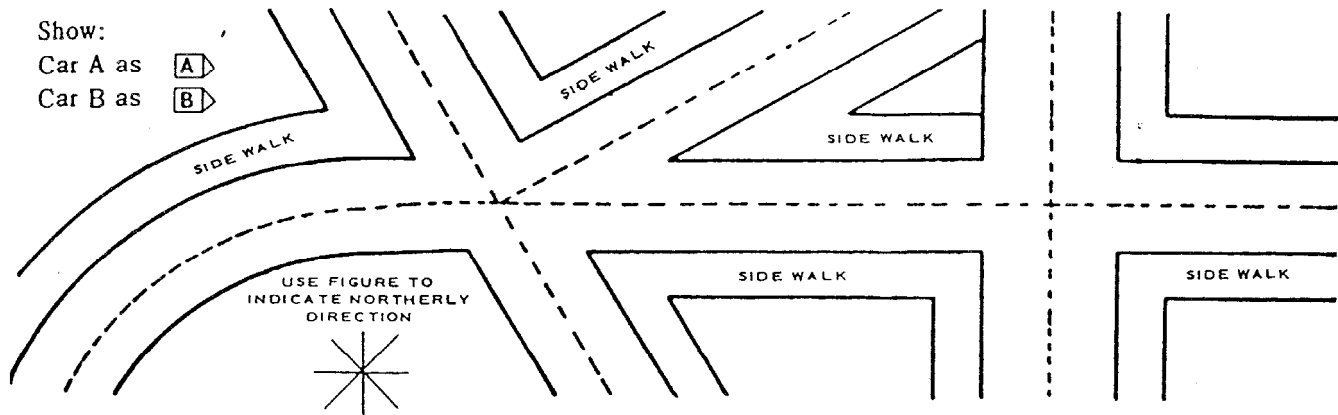
WHAT ACTIONS, EVENTS OR CONDITIONS CONTRIBUTED MOST DIRECTLY THIS ACTION? (Root Causes)

WHAT CAN BE DONE TO PREVENT FURTHER ACCIDENTS OF THIS TYPE? _____

WHAT HAS BEEN DONE / OTHER COMMENTS? _____

SIGNATURE OF SUPERVISOR _____

cc: ☐ Branch Manager ☐ Safety Officer ☐ RSC ☐ Risk Management Dept.

MVA Supervisor Investigation Addendum**Accident Scene Diagram**

Was Employee a Professional Driver (CDL)?

☐ Yes ☐ No

Was a Post-Accident Drug Test Completed?

☐ Yes ☐ No

Result: _____

Employee Years Driving Experience? _____

Vehicle Description (Yr/Make/Model): _____

Vehicle GVW: _____

Hazardous Material Being Hauled?

☐ Yes ☐ No

If yes, describe material spilled: _____

Vehicles Hauled From Scene:

☐ Yes ☐ No

If yes, # of vehicles towed? _____

Any injuries resulting in more than first aid?

☐ Yes ☐ No

Any Fatalities?

☐ Yes ☐ No**EMPLOYEE DESCRIPTION OF ACCIDENT:****OTHER WITNESS/ OCCUPANTS:**

NAME

STREET ADDRESS

CITY-TOWN

PHONE

NAME

STREET ADDRESS

CITY-TOWN

PHONE

I certify based on my knowledge that the above information is correct:

Employee / Driver Signature

Date



Appendix 30-5

GUIDE FOR DETERMINING MOTOR VEHICLE INCIDENT PREVENTABILITY

1.0 Introduction

This guide will assist you, when investigating an incident, in determining whether the incident was preventable or not on the part of our driver.

As the incident investigator, you are expected to obtain as many facts as possible and to consider all conceivable conditions in arriving at your decision. You may want to contact the National Safety Council to assist you in arriving at your decision, if you are uncertain as to whether the incident was preventable or not.

An incident is preventable if the driver could have reasonably done something to avoid it. Drivers are expected to drive defensively. Which driver was primarily at fault, who received a traffic citation or whether a claim was paid has absolutely no bearing on preventability. If there was anything our driver could have reasonably done to avoid the collision, then the incident was preventable.

An incident is non-preventable when the vehicle was legally and properly parked, or when properly stopped because of a highway patrol officer, a signal, stop sign, or traffic condition.

2.0 General Questions To Consider

When judging incident preventability, here are some general questions to consider. Further on in this guide are some specific situations for consideration.

- 1) Does the investigation indicate that the driver considers the rights of others, or is there evidence of poor driving habits that need to be changed?
- 2) Does the investigation indicate driver awareness? Such phrases as "I did not see," "I didn't think," "I didn't expect," or "I thought" are signals indicating there probably was a lack of awareness, and the incident was preventable. An aware driver should think, expect, and see hazardous situations in time to avoid collisions.
- 3) Was the driver under any physical handicap that could have been contributory? Did the incident happen near the end of a long day or long drive? Did overeating contribute to fatigue? Did the driver get prior sufficient sleep? Is the driver's vision faulty? Was the driver feeling ill?
- 4) Was the vehicle defective without the driver's knowledge? Was a pre-trip inspection done, and would it have discovered the defect? A car that pulls to the left or right when the driver applies the brakes, faulty windshield wipers, and similar items are excuses, and a driver using them is trying to evade responsibility. Sudden brake failure, loss of steering, or a blowout might be defects beyond the driver's ability to predict. However, pre-trip inspections and regularly scheduled maintenance should prevent most of these

problems. If either of these are the cause of the incident, then the incident was probably preventable by the driver.

- 5) Could the driver have exercised better judgment by taking an alternate route through less congested areas to reduce the hazardous situations encountered?
- 6) Could the driver have done anything to avoid the incident?
- 7) Was the driver's speed safe for conditions?
- 8) Did the driver obey all traffic signals?
- 9) Was the driver's vehicle under control?

3.0 Specific Types of Incidents

3.1 Intersection Collisions

Failure of our driver to yield the right-of-way, regardless of who has the right-of-way, as indicated by stop signs or lights, is preventable. The only exception to this is when the driver is properly proceeding through an intersection protected by lights or stop signs and the driver's vehicle is struck in the extreme rear side of the vehicle.

Regardless of stop signs, stop lights, or right-of-way, a defensive driver recognizes that the right-of-way belongs to anyone who assumes it and should yield accordingly.

Questions to consider:

- 1) Did the driver approach the intersection at a speed safe for conditions?
- 2) Was the driver prepared to stop before entering the intersection?
- 3) Did the driver pull out slowly at a blind corner, ready to apply the brakes?
- 4) Did the driver look both ways before proceeding through the intersection?

U-turns disrupt the normal smooth flow of traffic. An incident that occurs while our driver is attempting this maneuver is considered preventable.

3.2 Sideswipes

Sideswipes are often preventable. Defensive drivers do not get into a position where they can be forced into another vehicle or vice versa. Defensive drivers continuously check for escape routes to avoid sideswipes. For two-lane roads, this means a driver should pass another vehicle only when absolutely certain that he or she can safely complete the pass. A driver should also be ready to slow down and let a passing vehicle that has failed to judge safe passing distance back into the lane.

A driver should make no sudden moves that may force another vehicle to swerve. If a driver sideswipes a stationary object while taking evasive action to avoid striking another car or a pedestrian, such an incident may be preventable.

However, you should consider what the driver could have done or failed to do immediately preceding the evasive action to be in the position of no other options.

A driver is also expected to anticipate the actions of an oncoming vehicle.

Sideswiping an oncoming vehicle is often preventable. Again, evasive action, including leaving the roadway, may be necessary if an oncoming vehicle crosses in to the driver's lane.

Drivers are expected to allow merging vehicles to merge smoothly with them, and to merge smoothly on controlled access highways.

Sideswipes to doors of a vehicle that are opened when the vehicle is in motion are considered preventable.

Drivers are expected to be able to gauge distances properly when leaving a parking place and enter traffic smoothly.

Questions to consider:

- 1) Did the driver look to front and rear for approaching and overtaking traffic immediately before starting to pull away from the curb?
- 2) Did the driver signal before pulling away from the curb?
- 3) Did the driver look back rather than depend only upon rear-view mirrors?
- 4) Did the driver start into traffic only when this action would not require traffic to change its speed or direction in order to avoid his or her vehicle?

3.3 *Head-On Collision*

A head-on collision with a vehicle traveling in the wrong lane may be preventable if the driver could have pulled off the road or taken other evasive action to prevent a collision. However, the driver should never drive into the other lane to avoid the oncoming vehicle. If the driver swerved off the road to avoid a head-on collision, the incident is non-preventable. The driver in this case made a good defensive driving decision, taking the lesser of two evils.

3.4 *Skidding*

Many skidding conditions are caused by rain, freezing rain, fog, and snow, which all increase the hazard of travel. Oily road film, which builds up during a period of good weather, causes an especially treacherous condition during the first minutes of a rainfall.

Loss of traction can be anticipated, and these incidents usually are preventable.

Driving too fast for conditions or choosing to drive whether or not driving is the most common reasons why these types of incidents are preventable.

Questions to consider:

- 1) Was the driver operating at a safe speed considering weather and road conditions?
- 2) During inclement weather was the driver keeping at least twice the safe following distance used for dry pavement?
- 3) Were all actions gradual?
- 4) Was the driver anticipating ice on bridges, in gutter, ruts, and near the curb?
- 5) Was the driver alert for water, ice or snow in shaded areas, loose gravel, sand, ruts, etc.
- 6) Did the driver keep out of other vehicle tracks or cross them at wide angles?

If a driver goes off the road or strikes another vehicle because of skidding, the incident is preventable.

3.5 Pedestrian Collision

All types of pedestrian incidents, including collision with pedestrians coming from between parked cars, are usually considered preventable. There are few instances where the action of pedestrians is so unreasonable that the operator could not be expected to anticipate such an occurrence.

Questions to consider:

- 1) Did the driver go through congested sections expecting that pedestrians would step in front of the vehicle?
- 2) Was the driver prepared to stop?
- 3) Did the driver keep as much clearance between his or her vehicle and parked vehicles, as safety permitted?
- 4) Did the driver stop when other vehicles had stopped to allow pedestrians to cross?
- 5) Did the driver wait for the green light or stop for the caution light?
- 6) Was the driver aware of children and prepared to stop if one ran into the street?
- 7) Did the driver give all pedestrians the right-of-way?

- 8) Did the driver stop for a school bus, which was stopped, and properly signaling that passengers were loading or unloading?

3.6 *Animal Collisions*

Collisions with animals are normally preventable, unless the movement on the part of an animal was unusual and unexpected. Usually, these types of incidents occur after dark in sparsely populated areas, which are well known to have deer and other animals present. Hence, the inability to avoid collision is often the result of overdriving the headlights, i.e. driving too fast for conditions.

3.7 *Backing A Vehicle*

Backing a vehicle into another vehicle, an overhead obstruction, or a stationary object are normally preventable. The fact that someone was directing the driver in backing does not relieve the driver of the responsibility to back safely.

Questions to consider:

- 1) Was it necessary to back?
 - a) Did the driver plan ahead so that he or she could have pulled forward out of the parking space instead of backing?
 - b) Was it necessary to drive into the narrow street, dead-end alley, or driveway from which he or she backed?
- 2) If the driver could not see where he or she was backing:
 - a) Did the driver try to get someone to guide him or her?
 - b) Did the driver look all around the vehicle before backing?
 - c) Did the driver back immediately after looking?
 - d) Could the driver hear warnings originating outside the vehicle (e.g. was the radio off, and/or the windows open)?
 - e) Did the driver use the horn while backing?
 - f) Were the back-up lights working?
 - g) Did the driver look to the rear without relying totally on the rear-view mirror?
 - h) If the distance was long, did the driver stop, get out, and look around occasionally?
- 3) Did the driver back slowly?
- 4) Did the driver judge clearances accurately?



Appendix 30-6

DRIVER'S VEHICLE INSPECTION REPORT
AS REQUIRED BY THE DOT FEDERAL MOTOR CARRIER SAFETY REGULATIONS

DATE: _____ TIME: _____ A.M. _____ P.M.

CHECK ANY DEFECTIVE ITEM AND GIVE DETAILS UNDER "REMARKS"

TRACTOR/TRUCK/DRILL RIG NO. _____ SPEEDOMETER READING _____

<input type="checkbox"/> Air Compressor	<input type="checkbox"/> Horn	<input type="checkbox"/> Springs
<input type="checkbox"/> Air Lines	<input type="checkbox"/> Lights	<input type="checkbox"/> Starter
<input type="checkbox"/> Battery	Head-Stop	<input type="checkbox"/> Steering
<input type="checkbox"/> Body	Tail – Dash	<input type="checkbox"/> Tachgraph
<input type="checkbox"/> Brake Accessories	Turn Indicators	<input type="checkbox"/> Tires
<input type="checkbox"/> Brake	<input type="checkbox"/> Mirrors	<input type="checkbox"/> Tire Chains
<input type="checkbox"/> Carburetor	<input type="checkbox"/> Muffler	<input type="checkbox"/> Transmission
<input type="checkbox"/> Clutch	<input type="checkbox"/> Oil Pressure	<input type="checkbox"/> Wheels
<input type="checkbox"/> Defroster	<input type="checkbox"/> Radiator	<input type="checkbox"/> Windows
<input type="checkbox"/> Drive Line	<input type="checkbox"/> Red End	<input type="checkbox"/> Windshield
<input type="checkbox"/> Engine	<input type="checkbox"/> Reflectors	<input type="checkbox"/> Wipers
<input type="checkbox"/> Fifth Wheel	<input type="checkbox"/> Safety Equipment	<input type="checkbox"/> Others
<input type="checkbox"/> Front Axle	Fire Extinguisher	
<input type="checkbox"/> Fuel Tanks	Flags – Flares – Fuses	
<input type="checkbox"/> Generator	Spare Bulbs & Fuses	
<input type="checkbox"/> Heater	Spare Seal Beam	

TRAILER(S) NO.(S) _____

<input type="checkbox"/> Brake Connections	<input type="checkbox"/> Hitch	<input type="checkbox"/> Tarpaulin
<input type="checkbox"/> Brakes	<input type="checkbox"/> Landing Gear	<input type="checkbox"/> Tires
<input type="checkbox"/> Coupling Chains	<input type="checkbox"/> Lights – All	<input type="checkbox"/> Wheels
<input type="checkbox"/> Coupling (king) pin	<input type="checkbox"/> Roof	<input type="checkbox"/> Other
<input type="checkbox"/> Doors	<input type="checkbox"/> Springs	

Remarks: _____

☐ CONDITION OF THE ABOVE VEHICLE IS SATISFACTORY

DRIVER SIGNATURE: _____

☐ ABOVE DEFECTS CORRECTED

☐ ABOVE DEFECTS NEED NOT BE CORRECTED FOR SAFE OPERATION OF VEHICLE

MECHANIC'S SIGNATURE: _____ DATE: _____

DRIVER'S SIGNATURE: _____ DATE: _____

*The driver must review the previous day's inspection report and acknowledge all deficiencies have been corrected.



Appendix 30-7

MONTHLY VEHICLE CONDITION REPORT

Date: _____

Vehicle Make	Model	Year	Color
Serial No.	License No.	Mileage	

Notice to Inspectors: Please conduct a complete inspection. Indicate a check \sqrt for satisfactory and an "x" for unsatisfactory.

Fluid Levels

_____ Oil
_____ Transmission Fluid
_____ Windshield Washer Fluid
_____ Brake Fluid

Exterior Front

_____ Headlights
_____ Turn Signals and Flashers
_____ Tires and Wheel Lugs
_____ Bumpers
_____ Reflectors

Tire Pressure

Left Right
_____ Front
_____ Rear
_____ Spare

Interior

_____ Oil pressure light or gauge
_____ Instruments panel (lights and buzzers)
_____ Horn
_____ Windshield wipes and washers
_____ HVAC
_____ Mirrors
_____ Steering Wheel (excess play)
_____ Starts properly
_____ Parking Brake

Emergency Equipment

_____ Fire Extinguisher
_____ First Aid Kit
_____ Flares, Reflectors, Flags

Exterior Rear

_____ Tail Lights
_____ Turn Signals and Flashers
_____ Tires and Wheel Lugs
_____ Bumpers
_____ Reflectors

Cleanliness

_____ Interior
_____ Exterior

Mechanical

_____ Engine knocks, misses, overheats
_____ Clutch skips, grabs, etc.
_____ Transmission, noisy, hard shifting, jumps out of gear, etc.
_____ Axles noisy, etc.
_____ Steering loose, shimmies, etc.
_____ Air, oil, water leaks
_____ Springs, Shocks
_____ Brakes noisy, soft, etc.
_____ Speedometer, Tachometer
_____ Other: _____

Comments: _____

Date & Type Maintenance Last Performed: _____

Date & Type Maintenance Due Next (per Donlen or Manufacturer): _____

Inspector Signature

[illegible]


6.2 2 Distracted Driving

Distracted driving can lead to vehicle incidents, employee injuries, and property damage. In addition, there are significant liabilities associated with incidents involving other parties. To minimize the potential for incidents involving distracted driving, ATC has established specific expectations for all vehicle drivers, whether using a company vehicle or personal vehicle for company business.

The following are the specific driver expectations, and are applicable whenever driving on company business. Drivers shall:

1. Be responsible for the safe operation of the vehicle at all times;
2. Have all appropriate licenses;
3. Have received Defensive Driving training within the past two (2) years;
4. Obey posted signage and speed limits;
5. Ensure that all occupants are wearing seat belts at all times when vehicle is being operated;
6. Demonstrate safe driving behavior at all times when operating a vehicle; and
7. Avoid all distractions while driving. This includes:
 - a. Not eating, applying makeup, combing hair, reading, and similar distracting activities; and
 - b. Not using portable electronic devices or cell phones.

NOTE: If it is necessary to use such a device while traveling, the driver should carefully pull off the road and properly park in a safe location prior to using the device.

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1.0 Policy

Tools provided by both ATC Associates and employees shall be in good working order and shall be safely used for their intended purpose in accordance with manufacturer specifications.

This policy covers minimum performance standards applicable to all ATC Associates employees and locations. Local practices requiring more detailed or stringent rules, or local, state or other federal requirements regarding this subject can and should be added as an addendum to this procedure as applicable.

2.0 Purpose

To define the procedures for the safe use, care, and inspection of tools that are owned and rented by ATC Associates, and employee-provided tools.

3.0 Scope

Applies to all ATC Associates work sites, i.e., ATC offices, client job sites, etc.

4.0 Definitions

Competent Person means the person (because of knowledge, skill, training and experience) who is capable of inspecting and testing tools to identify defects, and with respect to tool repairs, is capable of repairing tools in accordance with manufacturer requirements, to eliminate defects.

5.0 Requirements


5.1 General

Appropriate personal protective equipment (PPE) shall be used with all tools (see the PPE section (25) of this manual).

Electrically powered tools shall not be carried, toted, hoisted, lowered or handled by their electrical cords. (Reference Electrical-General Section (12) of this manual for specific electrical safety information related to tool use)

Where practical tools or devices should be used to hold chisels, stakes, and other implements driven or struck with a hammer. Hands shall be kept clear of impact tools.

Guards shall be kept in place when tools are in use.

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With ladder use, tools such as grinders, drills, and large pipe wrenches that cannot be carried safely in a tool belt shall be transported to/from elevation by a rope or by other means.

Tools, except for small tools within a waist tool belt, shall not be carried while climbing ladders, platforms, and other structures where the hands are required for gripping, stability, movement and balance.

Precautions shall be taken to prevent tools from dropping onto others and equipment that could be damaged by falling objects. Protective devices such as netting, barricades, signs, and wire mesh shall be used to provide protection and warn others of the danger of falling objects.

Tools shall not be altered from their original design.

Authorized personnel according to established procedures shall decontaminate tools that are contaminated.

Tools shall not be tossed from person to person.


Tools shall not be dropped or thrown.

Tools shall be used according to their design. Handles shall be in place and used during the operation.

Tools shall not be left on scaffolds or elevated workspaces.

On-off switches controlling the operation of hand-held powered tools shall conform to the following requirements:

- Hand-held powered platen sanders, grinders with 2-inch or less diameter wheels, routers, planers, laminate trimmers, nibblers, shears, scroll saws, and jigsaws with blade shanks 0.25 inch wide or less may be equipped with only a positive on-off control
- Hand-held powered drills; tappers; fastener drivers; horizontal, vertical, and angle grinders with wheels exceeding 2 inches in diameter; disk sanders; belt sanders; reciprocating saws; saber saws; and other similar tools shall be equipped with a momentary contact on-off control. They may have a lock-on control provided the turnoff can be accomplished by a single motion of the same finger or fingers that turn it on

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- Jackhammers, with exception of concrete vibrators, and similar pneumatic-powered handtools and other hand-held power tools including chainsaws, circular saws, and percussion tools shall be equipped with a constant pressure switch that shuts off power when pressure is released

Only non-sparking tools shall be used in locations where sources of ignition may cause an explosion or fire.

Employees shall not work under areas where hand-held tools are being used unless the tools are equipped with restraining straps or appropriate decking, planking, and netting are provided for employee protection.

When the periphery of the blades of a fan is less than seven (7) feet above the floor or working level, the blades shall be guarded. The guard shall have openings no larger than 1/2 inch.

Machines designed for a fixed location shall be securely anchored to prevent walking or moving.


The operator and power tool(s) should be in a stable and normal position to perform the work properly with power tools. If access to a location where work is to be performed is difficult, if the work surface is in an awkward position or if the operator is required to be in an awkward position to perform the work, the work should not be performed with power tools. If the access cannot be reconfigured to provide a stable and normal position, as a last resort the tool shall be supported by means of a rope or similar support of adequate strength.

Loose or frayed clothing or long hair, dangling ties, finger rings, etc. shall not be worn around moving machinery or other sources of entanglement.

5.2 Inspections

Users shall be trained to visually inspect the tools they are assigned to use.

Users are responsible for visually inspecting the tools they use each day for visual defects. Rented tools shall be inspected prior to leaving the rental store. Defective tools shall be reported to the appropriate supervisor, and taken out of service. Rented tools that are defective shall be returned to the rental store for replacement or repair.

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Tools shall be inspected by a competent person at least annually (unless dictated more frequently by regulation, manufacturer's recommendation or local policy) for defects, adequate guards, handles, electrical integrity, and general working condition. OSHA regulations require jacks (such as those used for vehicle maintenance) to be inspected no less than every 6 months; whenever subjected to abnormal load or shock; and whenever sent out for special work (before being sent out and upon return).

Inspections required by the previous paragraph shall be documented and kept on file by the Branch Safety Officer. The information to be recorded shall include type of tool, tool identification number (if available), condition of tool (good/acceptable, defective/unacceptable) and repairs required. Groups of tools may be identified as a group by indicating the type and number of tools inspected (e.g., "group of 20 screw drivers, hammers, chisels and similar tools inspected with no defects noted"). Documentation may be destroyed after two calendar years from date of inspection; this means the file should include two year's documentation (the current year and prior year). The purpose of retaining records for two years is to give Safety Officers the opportunity to identify tools that have a tendency to become defective, and decide what changes may be needed to prevent future defects (e.g., purchase better quality tools, carefully monitor employee tool use and care, or establish more frequent preventive maintenance inspections).

"Do Not Use" tags shall be attached to defective tools. The tag shall have the name of the person who attached it, date, and a description of the defect. The appropriate supervisor shall be notified when a defective tool is tagged out of service.

Defective tools shall be stored where they cannot be used until they are repaired. Non-repairable tools shall be destroyed.


Only competent persons shall inspect, test or repair hand or power tools.

5.3 Abrasive Blasting Tools

The blast cleaning nozzles shall be equipped with an operating valve, which must be held open manually. A support shall be provided on which the nozzle may be mounted when it is not in use.

Abrasive blasting suits shall be inspected at least monthly for leaks, tears, and general conditions.

Users shall inspect blasting suits daily for defects. Defective equipment shall be

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taken out of service until repairs are completed, or the suit is replaced.

5.4 Air hoses

All hoses exceeding 0.5-inch inside diameter shall have a safety device at the source of supply or branch line, which will automatically reduce pressure in case of a line failure. All connections, couplings, and splices in air lines exceeding 0.5-inch inside diameter shall be equipped with clips and wire rope or chain lashings. The clips and lashings shall be installed in a manner that prevents whipping of the hose line, should the connection coupling or splice fail.

Air hoses shall not be disconnected at compressors until air pressure has been bled off.

The manufacturer's safe operating pressure for hoses, pipes, valves, and fittings shall not be exceeded. Defective hoses, valves, and fittings shall be removed from service.

Compressed air shall not be directed at any part of the body. Compressed air shall not be used for cleaning purposes, except when reduced to less than 30 lb/in², and then only with effective chip guarding and the operator protected by applicable personal protective equipment.

Air hoses shall not be used for hoisting or lowering tools. Hoses shall not be laid on ladders, steps, scaffolds, or walkways in a manner creating a tripping hazard. Air hoses shall not be exposed to damage from vehicle or other traffic.

5.5 Drill Press

Pieces of metal being drilled shall be held tightly in a vise or clamp.


Before drilling, the employee shall check the spindle speed and the setup.

Before drilling, the chuck key shall be removed. Never leave the chuck key in the chuck.

5.6 Electric Powered Tools (general)

Electric powered tools shall be double-insulated type or effectively grounded as required for ground fault protection or other grounding and bonding requirements.

Power cords shall not be used for hoisting or lowering tools. Power cords shall not be laid on ladders, steps, scaffolds, or walkways in a manner creating a tripping hazard. Electric power cords shall not be exposed to damage from

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vehicle or other traffic.

When automatic restarting would create a hazard, electrically driven equipment shall be controlled with a device that will prevent automatic restarting following a power failure.

5.7 Fuel Powered Tools (general)

Fuel powered tools shall be stopped while being refueled, serviced, or maintained, and fuel shall be transported, handled, and stored as appropriate for hazardous materials.

When fuel powered tools are used in enclosed spaces, the applicable requirements for concentrations of toxic gases and use of personal protective equipment shall apply.

Fuel containers shall be properly labeled, be of metal construction and provided with a self closing lid. No plastic fuel containers are allowed.

Gasoline powered tools shall not be used underground or in locations where toxic exhaust gases can accumulate unless proper ventilation is provided and there is continuous monitoring of oxygen, flammable vapors and toxic gases.

5.8 Grinders


The maximum angular exposure of the grinding wheel periphery and sides for safety guards used on cylindrical grinding machines shall not exceed 180°. This exposure will begin at a point not more than 65° above the horizontal plane of the wheel spindle.

All abrasive wheels shall be closely inspected and ring-tested before mounting to ensure that they are free from cracks or other defects. Cracked or defective abrasive wheels shall be removed from service immediately.

Grinding wheels shall be carefully installed and not forced.

Whenever possible, when grinding with a portable grinder, position the grinding wheel so that the sparks and steel go away from the person doing the work. Nonferrous metal should not be ground because of the danger of exploding grinding wheels, unless the grinding wheel is designed to grind these metals.

Sheet metal and other small pieces of work shall never be ground on a pedestal grinder.

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Grinding shall never be done against the side of the wheel.

Grinding wheels shall not be used if the pores are clogged. The wheels shall also be free of large chips and grooves.

5.9 Grinders (bench and floor stand)

The angular exposure of the grinding wheel periphery and sides for safety guards used on machines known as bench and floor stands should not exceed 90° or one-fourth of the periphery. This exposure will begin at a point not more than 65° above the horizontal plane of the wheel spindle. Whenever the nature of the work requires contact with the wheel below the horizontal plane of the spindle, the exposure shall not exceed 125°.

Floor and bench-mounted grinders shall be provided with readily adjustable work rests, which are rigidly supported. The tool rest shall always be set within 1/8 inch away from the wheel. The nose guard shall be adjusted to within 1/4 inch of the wheel.

Grinding tools shall not be used without the safety guards.

All abrasive wheel bench and stand grinders shall be provided with safety guards that cover the spindle ends, nut, and flange projects and are strong enough to withstand the effects of a bursting wheel.


Safety guards where the operator stands in front of the opening shall be constructed so that the peripheral protecting member can be adjusted to the constantly decreasing diameter of the wheel. The maximum angular exposure above the horizontal plane of the wheel spindle as specified below shall never be exceeded, and the distance between the wheel periphery and the adjustable tongue or the end of the peripheral member at the top shall never exceed 1/4 inch.

5.10 Hand Tools (general)

Sharp tools such as chisels, screwdrivers, knives, and pointed objects shall not be carried in clothes pockets. Sharp tools carried by hand shall have the sharp or pointed end facing away from the body.

Lengths of pipe shall not be used as an extension of a tool to increase torque. For example, a length of pipe inserted over the handle of a pipe wrench.

Persons shall not hammer on spanner wrenches or other tools unless they are designed for that purpose (e.g., screwdrivers shall not be used as chisels).

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The wooden handles of tools shall be kept free of splinters or cracks and shall be kept tight in the tool. Impact tools, such as drift pins, wedges, and chisels, shall be kept free of mushroomed heads.

Wrenches, including adjustable pipe, end, and socket wrenches, shall not be used if jaws are broken, damaged or deformed.

Files shall be equipped with handles and not be used to punch or pry.

5.11 Hydraulic-Powered Tools (general)

The manufacturer's safe operating pressure for hoses, valves, pipes, filters, and fittings shall not be exceeded.

The fluid used in hydraulic powered tools shall be an approved fire-resistant fluid and checked on a regular basis.

Stationary presses shall be provided with guards that adequately contain flying particles forcibly expelled from the material being compressed.

5.12 Jacks (ratchet, screw, and hydraulic)

The manufacturer's rated capacity shall be legibly marked on jacks and shall not be exceeded.

Jacks of any type shall have a positive stop to prevent overtravel.


Jacks shall be set on a stable and firm footing and cribbed or blocked where necessary to prevent settlement or dislodgment. Where there is a possibility of slippage of the metal cap of the jack, a wood block shall be placed between the cap and the load. After the load has been raised, it shall be cribbed, blocked, or otherwise secured immediately.

Persons shall not work under vehicles supported by bumper jacks or chain hoists without protective blocking that will prevent injury if jacks or hoists should fail.

Jacks shall be properly lubricated at regular intervals.

Each jack shall be inspected at times that depend upon the service conditions. Inspections shall be not less frequent than the following:

- For constant or intermittent use at one locality, once every 6 months

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- For jacks sent out of shop for special work, when sent out, and when returned
- For a jack subjected to abnormal load or shock, immediately before and immediately thereafter
- Repair or replacement parts shall be examined for possible defects
- Jacks which are out of order shall be tagged accordingly and shall not be used until repairs are made

Hydraulic jacks exposed to freezing temperatures shall be supplied with an adequate antifreeze liquid.

5.13 Nail Guns (pneumatic)

Shall be provided with an automatically closing valve actuated by a trigger located inside the handle where it is reasonably safe from accidental operation. The machine shall operate only when the trigger is depressed.

Do not pull trigger or depress contact arm while connected to air supply.

When in operation the contact arm shall always be pointed away from the operator and other personnel.


The air supply shall be disconnected when reloading or servicing of a nailing gun.

Electric- pneumatically driven nailers, staplers, and similar equipment provided with automatic fastener feed, which operate at more than 100 lb/in², shall have a safety device on the muzzle to prevent the ejection of the fasteners unless the muzzle is in contact with the work surface.

5.14 Pneumatic Tools (general)

The pneumatic impact tools shall have the following features:

- An automatically closing valve activated by a trigger located inside the handle where it is reasonably safe from accidental operation. The machine shall operate only when the trigger is depressed
- A retaining device that holds the tool in place so that it cannot fly off accidentally from the barrel

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- Be provided with heavy rubber grips to reduce operator vibration and fatigue

Pneumatic power tools shall be secured to the hose in a positive manner to prevent accidental disconnection.

5.15 Powder-Actuated Tools

Powder-actuated tools shall be operated and serviced only by persons who have been trained in the use of such tools. While using this tool, operators shall possess a valid training course certificate, operator's card or similar document indicating the successful completion of training, as issued by a firm or person competent to provide such training.

Operators of powder-operated tools shall wear safety goggles and face shields and utilize hearing protection when the tool is in use. Other employees working in close proximity to this activity shall also utilize hearing protection.

Powder-actuated tools shall not be used in explosive or flammable atmospheres.


Only powder charges, studs, or fasteners specified by the manufacturer for the specified tool shall be used.

Tools shall be designed to operate only when pressed against the work surface with a force at least 5 pounds greater than the weight of the tool. They shall be constructed so the tool cannot fire when dropped or during loading or preparation to fire. All tools shall be used with the correct shield, guard, or attachment recommended by the manufacturer.

Driving into soft or easily penetrated material is prohibited unless the material is backed to prevent the pin or fastener from passing completely through and creating a flying missile hazard on the other side. Tools shall not be used on very hard or brittle materials including, but not limited to, cast iron, glazed tile, surface hardened steel, glass block, live rock, face brick, or hollow tile. No fastener shall be driven into a spalled area caused by an unsatisfactory fastening.

Tools shall not be loaded until just prior to firing. Loaded tools shall not be left unattended. Neither loaded nor empty tools shall be pointed at any person, and all parts of the body shall be kept clear of the muzzle.

Tools shall be tested each day before loading to ensure that the safety devices are in proper working order; the test shall be conducted in accordance with the

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manufacturer's recommended test procedures.

High-velocity tools shall be used only for those applications where low-velocity tools will not meet the job requirements.

Work sites where powder actuated tools are used shall maintain a list of all powder-actuated tools and names of trained operators. This list shall be made available at the control point of where tools are issued or controlled and distributed to supervisory personnel as appropriate.

Signs warning of the use of powder-actuated tools shall be posted appropriately.

5.16 Saws (bench and radial-arm)

Bench-type circular saws shall be equipped with spreaders, anti-kickback devices, and guards that automatically enclose the exposed cutting edges.

For saws over 20 inches in diameter or operating speeds over 10,000 peripheral feet per minute only blades designed for use at the marked operating speed shall be used. When the saw is re-tensioned for a different speed, the marking shall be changed to indicate the new speed.

Radial arm saws and swing cutoff saws shall be equipped with:


- Limit stops, which prevent the leading edge of the blade from traveling beyond the edge of the table
- Hoods and/or guards that protect the operator from flying material, direct the sawdust toward the back of the blade, and enclose all parts of the blade not in contact with the material being cut
- Automatic brakes or automatic return devices

Power saws shall not be left running and unattended.

Push sticks or other devices shall be used to guide materials through the cutting plan of circular saws.

The hand, arm or any other part of the body shall not pass over the saw blade while it is in operation.

Bench-type circular saws and radial saws shall be equipped with enclosed-type sawdust collectors.

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Cracked, bent, or otherwise defective blades shall be removed from service.

The blade of a tablesaw shall not be set higher than (1/16") one sixteenth of an inch above the material being cut.

5.17 Saws (portable electric)


Portable circular saws shall have the following features:

- Guards above and below the base plate
- The upper guard shall cover the saw to depth of the teeth, except for the minimum arc required to permit the base to be tilted for bevel cuts
- The lower guard shall cover the saw to the depth of the teeth, except for the minimum arc required to allow proper retraction and contact with the work
- When the tool is withdrawn from the work the lower guard shall automatically and instantly return to the covered position
- Be equipped with a constant pressure switch or control that shuts off the power when pressure is released
- May have a lock-on control provided that the saw can be turned off with a single motion of the finger that turned on the saw
- Operating controls shall be located as to minimize the possibility of accidental operation that would constitute a hazard to employee's safety
- The hand, foot, knee, leg or any other part of the body shall not be used as a support for materials

5.18 Spray Guns (airless)

Airless spray guns of the type which atomize paints and fluids at pressures of 1,000 lb/in² or more shall be equipped with automatic or visible manual safety devices, which will prevent pulling of the trigger and prevent release of the paint or fluid until the safety device is manually released.

In lieu of the above, a diffuser nut to prevent high-pressure release when the

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nozzle tip is removed and a nozzle tip guard to prevent the tip from contacting the operator or other equivalent protection shall be provided.

5.19 Washing and Steam Units (high pressure)

Employees who use high pressure washing tools and steam cleaning systems shall follow the manufacturer operating instructions and wear required protective equipment.

As a minimum, operating personnel are required to wear protective footwear, facial protection, and hand protection as determined by the operating process, operating design, and manufacturer specifications.

Employees who operate high pressure washing units or steam systems shall be trained and qualified by a competent person.

5.20 Winches and Hoists (hand-powered)

Hand-powered winches and hoists shall be used within the manufacturer's rated capacity, and the capacity shall be legibly marked on the winch or hoist.

The use of hand cranks is prohibited unless the winch or hoist is equipped with positive self-locking dogs or if the wormgear type hand wheels do not have projecting spokes or knobs.

5.21 Woodworking Tools (general)


Switches shall be located to enable the operator to cut off the power without leaving his operating position. Fixed power-driven tools shall be provided with a disconnect switch that can be locked or tagged in the off position.

Whenever the nature of the work will permit, automatic feeding devices shall be installed on fixed power-driven woodworking tools. Feeder attachments shall have the feed rolls and/or other moving parts guarded to protect the operator.

When automatic restarting would create a hazard, electrically driven equipment shall be controlled with a device that will prevent automatic restarting following a power failure.

A push stick, block, or similar safe means shall be used for all operations close to high-speed cutting edges.

Planers and joiners shall be equipped with cylindrical cutting heads and fully

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guarded.


Band saw blades shall be fully enclosed except at the point of operation.

6.0 References

OSHA 29 CFR 1910 (as applicable)

OSHA 29 CFR 1926 (as applicable)

Applicable Manufacturer Manuals

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	Subject: Respiratory Protection	Revision:	03/2004
		Issue Date:	09/2003

1.0 Policy

Employees will be protected from the adverse effects of airborne contaminants or a lack of oxygen. Respiratory protection shall only be used when engineering controls are not feasible, while these engineering controls are being instituted or as protection above and beyond engineering controls.

This policy covers minimum performance standards applicable to all ATC Associates employees and locations. Local practices requiring more detailed or stringent rules, or local, state or other federal requirements regarding this subject can and should be added as an addendum to this procedure as applicable.

2.0 Purpose

To establish a program for the appropriate and effective use of respiratory protection equipment.

3.0 Scope

Applies to all ATC Associates work sites, i.e., ATC offices, client job sites, etc., where respirators are required.

4.0 Definitions

Airline Respirator (see Supplied-air Respirator)

Class A Respirator means an airline system – positive pressure demand system.


Class B Respirator means a Self Contained Breathing Apparatus (SCBA) – positive pressure, demand air system.

Class C Respirator includes all half mask and full-face negative pressure respirator.

Class D Respirator means an escape respirator only.

Employee Exposure means exposure to a concentration of an airborne contaminant that would occur if the employee were not using respiratory protection.

End-of-service-life Indicator (ELSI) means a system that warns the respirator user of the approach of the end of adequate respiratory protection, for example, that the sorbent is approaching saturation or is no longer effective.

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Fit Factor means a qualitative estimate of the fit of a particular respirator to a specific individual, and typically estimates the ratio of the concentration of a substance in ambient air to its concentration inside the respirator when worn.

Fit Test means the use of a protocol to qualitatively or quantitatively evaluate the fit of a respirator on an individual (see Qualitative Fit Testing and Quantitative Fit Testing).

Immediately Dangerous to Life or Health (IDLH) means an atmosphere that poses an immediate threat to life, would cause irreversible adverse health effects, or would impair an individual's ability to escape from a dangerous atmosphere.

Negative Pressure Respirator means a respirator, which the air pressure inside the facepiece is negative during inhalation with respect to the ambient air pressure outside the respirator.

Oxygen Deficient means an atmosphere with an oxygen content below 19.5% by volume.

Positive Pressure Respirator means a respirator in which the pressure inside the respiratory inlet covering exceeds the ambient air purifying element outside the respirator.

Qualitative Fit Testing means a pass/fail test to assess the adequacy of respirator fit that relies on the individual's response to the test agent.

Quantitative Fit Testing means an assessment of the adequacy of respirator fit by numerically measuring the amount of leakage into the respirator.


Self Contained Breathing Apparatus (SCBA) means an atmosphere-supplying respirator for which the breathing of air sources is designed to be carried by the user.

Supplied-air Respirator (SAR) or Airline Respirator means an atmosphere-supplying respirator for which the breathing air source is not designed to be carried by the user.

5.0 Requirements

5.1 General

Employees shall not be allowed to enter an area requiring the use of a respirator without meeting all applicable requirements of this Policy.

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All respirators, no matter what Class, shall be National Institute of Occupational Safety and Health (NIOSH) approved for the types and levels of contaminants they are to protect against.

Exposures and contaminant information shall be evaluated utilizing the location/project specific HASP (reference ATC EHS Manual, section 7 - Safety Systems / HASP) and documented on Appendix 27-3 for each worksite prior to work commencing so to appropriately determine the necessary brand and model of respirator to be utilized. If this cannot be accomplished, then the exposure shall be considered as immediately dangerous to life and health (IDLH), and only appropriate Class A or Class B respiratory protection shall be utilized until specific sampling and/or testing can be conducted to confirm employee exposure.

Medical evaluations shall be required of the Class A, B and C respirator users. Parameters of the medical evaluation are determined by a physician or other licensed health care professional (PLHCP) and the required regulations.

Training and fit testing shall be required initially (prior to use) and annually thereafter for respirator users.

Retraining shall occur before the next use of a respirator if:


- an employee is observed to demonstrate a lack of knowledge in the use of a respirator
- there are changes in the workplace rendering any prior training obsolete
- there are changes in the respiratory equipment

Respirators, medical evaluations, fit testing and required training shall be provided at no cost to all applicable employees.

5.2 Responsibilities

5.2.1 Branch Safety Officer

Maintains overall accountability for the respiratory protection program with direct program implementation and maintenance responsibilities.

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Acts as, or assigns responsibility to a competent person to directly oversee the requirements of the respiratory protection program for the Branch while still maintaining oversight responsibility (see 5.2.4).

Acts as, or assigns responsibility to a competent person to perform the necessary respirator maintenance as required (see 5.2.7).

Reviews effectiveness of the program on a regular basis with / as the competent person.

Interacts with location management regarding approval and/or changes in the respiratory protection program.

Ensure fit testing and training are properly documented.

Periodically audits respirator permitted areas to determine the effectiveness of the program.

Removes unapproved respirators from service.

Maintain a list of current approved respirators by NIOSH that are used in the Respiratory Program.

5.2.2 Department Managers

Ensures compliance with this Procedure within their department.

Informs the Branch Safety Officer of changes in supervisory positions.


Ensures correct respirators are available to department employees.

5.2.3 Project Managers / Supervisors

Ensures that employee training, fit testing and medical evaluation requirements are met.

Ensure proper respirators are available.

Maintains surveillance of work area conditions and levels of employee exposure or stress.

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Ensures that a tight fitting face piece respirator is not worn when conditions prevent a good face seal, e.g. facial hair that interferes with the face seal or temple pieces on glasses.

Notifies the Branch Safety Officer of any personnel or process changes related to, or that might impact the effectiveness of the respiratory protection procedure.

Refers all persons requiring certification (in their area) to the Branch Safety Officer for pre-evaluation, fit testing and training prior to being assigned work requiring the use of respirators.

5.2.4 Assigned Competent Person

Coordinates the overall implementation and maintenance of the Respiratory Protection Program.

Identifies and evaluates operations that contain airborne contaminants.

Ensures proper selection of respirators.

Evaluates respirator program's effectiveness.

Ensures proper documentation of training and fit testing is maintained.

Assists in training of respirator users.

Provides medical personnel with requested work-related information to assist in the examination.


Provides medical information on environmental conditions that the respirator shall be worn in.

Evaluates the effectiveness of the respirator program with the safety coordinator.

5.2.5 Employees

Ensures proper training is obtained before donning a respirator.

Ensures that a tight fitting face piece seal is available when required to wear a respirator.

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Checks the respirator fit after each donning as instructed.

Goes immediately to an area having respirable air if the respirator fails to provide proper protection.

Reports any respirator malfunction to the person responsible for maintenance.

5.2.6 Physician or other Licensed Health Care Professionals (PLHCP)

Medical evaluations shall be conducted by a PLHCP. They shall determine if the employee is medically fit to use a respirator.

They shall provide medical evaluation that shall include a medical history and spirometric test for Class A, B and C respirator users.

The frequency of follow-up medical evaluations shall occur defined by the health care professional during the initial evaluation, based on exposure.

5.2.7 Designated Maintenance Personnel

Ensures respirators are maintained and stored properly.

Ensures respirator face piece and parts cleaned with water detergent and sanitized.

Ensures parts are inspected and maintained as like new.


Ensures completely dried respirators are assembled and stored properly to protect against chemicals and environmental elements.

Ensures nonfunctional SCBA's are removed from service, overhauled, tested and documented as being functional before being placed into service.

Ensures air supply systems provide grade D breathable air to the respirator users face piece.

5.3 Respirator Selection

Exposures and contaminant information shall be evaluated utilizing the location/project specific HASP (reference ATC EHS Manual, section 7 - Safety

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Systems / HASP) and documented on Appendix 27-3 for each worksite prior to work commencing so to appropriately determine the necessary brand and model of respirator to be utilized. If this cannot be accomplished, then the exposure shall be considered as immediately dangerous to life and health (IDLH), and only appropriate Class A or Class B respiratory protection shall be utilized until specific sampling and/or testing can be conducted to confirm employee exposure.

The type of exposure (routine, non-routine, emergency) and expected airborne type and concentration level shall be evaluated when making a respirator selection. Branch Safety Officer shall identify the specific class, brand and model of respirators to be evaluated for employee selection. Employees shall be given a choice of style and size from this selection.

All respirators, no matter what Class, shall be National Institute of Occupational Safety and Health (NIOSH) approved for the types and levels of contaminants they are to protect against.

5.4 Respirator Assignment


Supervisors shall be responsible for enforcing regular respirator use. Respirators shall be issued by the Branch Safety Officer for routine and non-routine work to employees after medical evaluations, training and fit testing have been completed.

A list of authorized users by respirator type shall be maintained by the Branch Safety Officer (reference Appendix 27-3).

5.5 Medical Evaluation & Fit Testing

Prior to donning a respirator and/or fit testing, employees shall have a medical evaluation performed by a physician or other licensed health care professional (PLHCP) prior to being assigned to use a face-fitting respirator. A medical questionnaire (Appendix 27-1 or equivalent as furnished by ATC's current medical services provider) shall be completed by the employee, forward it to the Branch Safety Officer, who will then submit it to the PLHCP for review and approval.

Employees shall be fit tested prior to respirator utilization with their work activities. Any changes in physical attributes affecting their ability to wear/use the respirator shall be immediately reported to the Branch Safety Officer as to determine the need for further medical evaluation and fit testing.

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Sections 5.10.1 (Air-Purifying Respirator), 5.10.2 (SCBA) and 5.10.3 (Air Line) defines the specific fit-testing requirements for each type of respirator. Fit Testing shall be documented of the Respirator Fit Test & Training Record (Appendix 27-2).

Tight fitting face piece users shall not have facial hair that interferes with the face seal.

5.6 Training


Training shall be conducted when respirators are first issued or when any employee is assigned to a new area where respirator use is required. The supervisor is responsible for notifying the Branch Safety Officer before new employees enter applicable work areas.

Employees shall be instructed to change cartridges/canisters when breakthrough occurs or after each use. Employees shall be instructed to change filters when increased resistance occurs or after each use. Specifically, prior to using a respirator in the workplace, personnel who are issued respiratory protection shall receive classroom and hands-on training covering, at a minimum, the following from a competent individual:

- An opportunity to handle the respirator
- Proper fit testing
- Test of face/face piece seal
- A long familiarizing period of wear in normal air
- Explanation of how a particular type of respirator was selected, and its limitations
- Why a respirator is necessary
- How to clean a respirator
- How to maintain, clean and change cartridges
- How to use a respirator in emergency situations when the respirator malfunctions
- How to inspect, put on and remove a respirator
- How to recognize medical signs and symptoms
- General requirements of the OSHA standard (29 CFR 1910.134(k))

During fit testing provide or allow:

- Demonstration on donning (putting on and removing) a respirator
- Practice in wearing respirator
- Adjusting parts of equipment

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- How to determine the fit with positive and negative fit checks

Orientation training shall be documented of the Respirator Fit Test & Training Record (Appendix 27-2). In addition, skill assessments, written tests and other certifications as part of HAZWOPER courses, AHERA Asbestos courses and Lead Training courses shall be conducted and maintained in the employee training file as required by the work performed.

Retraining shall be conducted whenever deficiencies in the training program are identified or if the employee demonstrates a lack of knowledge, there is a change in environmental conditions or when new respiratory equipment is introduced.

Refresher training will be conducted at least annually and will review the same materials addressed at orientation along with any changes in this procedure.

5.7 Maintenance and Storage

Employees are responsible for cleaning and the storage of their assigned respirators; however, individual part replacement and sanitizing shall be arranged by the employee with the respirator maintenance person. Sections 5.10.1 (Air-Purifying Respirator), 5.10.2 (SCBA) and 5.10.3 (Air Line) defines the specific maintenance and storage requirements for each type of respirator.


For unassigned respirators, the competent person is responsible for sanitation and re-issuance. Respirator cleaning shall be done using an acceptable sanitizing kit or detergent and hot water as identified in an addendum to this policy.

Cleaning shall be done after use for unassigned respirators. The Competent Person shall collect used respirators.

5.8 Program Surveillance

Program effectiveness shall be evaluated through regular inspections of each area/situation where respirators are used and stored. The Branch Safety Officer and each manager / supervisor shall be responsible for these evaluations.

Work areas where emergency respirator use may be required shall be reviewed by the Branch Safety Officer to assure that adequate personnel are available at the work site on a 24-hour basis to complete or assist in completing required air monitoring.

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The procedures to be taken during an emergency are included in the Emergency Preparedness Plan (reference section (13) of this manual).

5.9 Recordkeeping

For the duration of work activities, records shall be kept at the worksite by the Branch Safety Officer or designee.

The following records shall be filed together and shall include:

- Written program and appendices
- The numbers and types of respirators in use
- The Employee Respirator Use Records
- Medical Evaluation(s)
- Program surveillance and inspection reports
- Respirator inspection logs and other maintenance information
- Respirator training records

5.10 Respirator Details

5.10.1 Air-Purifying Respirators (APR)


5.10.1.1 APR Selection

All APRs and their parts utilized by ATC personnel shall be certified by the National Institute of Occupational Safety and Health (NIOSH), and used in compliance with the conditions of its certification.

Because of the superior fit and increased eye protection, full facepiece APRs are recommended for many field situations. However, half-mask APRs may be used when protection from respiratory and/or eye injury hazards are adequately controlled.

The decision to use air-purifying respirators requires an understanding of the hazardous atmosphere within which the work is being conducted as well as relevant workplace and user factors. Specifically APRs shall only be used when:

- 1) The type of contaminant(s) and its chemical state and physical form is known.
- 2) A reasonable estimate of the employee's exposure is available based on past or present air monitoring.

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- 3) There is a cartridge or filter that will effectively remove the airborne contaminant.
- 4) A combination of the expected exposure and the respirators protection factor (PF) will keep the concentration inside the respirator below the action level or one-half the permissible exposure limit (PEL).
- 5) The individual wearer has been successfully fit-tested with a specific make, model and size APR.

APRs shall never be used in the following situations:

- 1) In oxygen deficient atmospheres (less than 19.5%).
- 2) In immediately dangerous to life and health (IDLH) atmospheres.
- 3) In atmospheres containing unknown types and concentrations of contaminants (i.e., initial site entry).


5.10.1.2 APR Fit Testing Procedure

Prior to using any air-purifying respirator, the employee must successfully pass a qualitative fit test to ensure the selection of the proper make, model, and size respirator. The employee must thereafter undergo the fit test procedure annually or whenever a different respirator facepiece is used.

In addition, a fit test will be performed whenever the employee or the employer, PLHCP, supervisor, or Branch Safety Officer makes visual observations of, changes in the employee's physical condition that could affect respirator fit. Such conditions include, but are not limited to, facial scarring, dental changes, cosmetic surgery, or an obvious change in body weight.

The entire qualitative fit test procedure consists of the initial size selection, negative pressure test, positive pressure test, and the irritant smoke test. Prior to conducting the fit test, the employee shall be given a description of the fit test and the employee's responsibilities during the test procedure. The description of the process shall include a description of the test exercises that the employee will be performing.

The respirator to be fit tested will be worn for at least five (5) minutes before the start of the fit test. Other fit test methods may be used as long as they are conducted in accordance with Appendix A and Appendix B of 29 CFR 1910.134.

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Fit testing of powered air-purifying respirators shall be accomplished in the negative pressure mode of operation (i.e. with the power turned off).

The fit test shall not be conducted if there is any hair growth between the skin and the facepiece sealing surface, such as stubble beard growth, beard, mustache or sideburns which cross the respirator sealing surface. Any apparel which interferes with a satisfactory fit shall be altered or removed.

If an employee exhibits difficulty in breathing during the tests, he/she shall be referred to a physician or other licensed health care professional, as appropriate, to determine whether the employee can wear a respirator while performing his/her duties.

If the employee finds the fit of the respirator unacceptable, the employee shall be given the opportunity to select a different respirator and be retested.

1) Initial Size Selection


Various sizes and types of APRs will be made available to the employee for initial size selection. The employee will be informed that he/she is being asked to select the respirator that provided the most acceptable fit. Assistance in choosing the proper size will be provided by a competent person.

Employees will be properly instructed on how to don the respirator including how to put it on, set the strap tension, and determine a comfortable fit. Particular attention will be paid to the seal across the forehead and beneath the chin.

A mirror will be available to assist the employee in evaluating the fit and positioning of the respirator. If the fit is apparently poor to the employee or the observer, another size, make, or model respirator will be tried. When a comfortable fit has been achieved, initial size selection will be considered complete.

2) Facepiece Positive and Negative Pressure Tests

Following initial size selection, a positive and negative pressure test shall be conducted. Employees shall be instructed to

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perform the positive and negative test each time they don their respirator.

Negative Pressure Test - The employee dons the respirator, then proceeds to close off the inlet opening(s) of the canister or cartridge(s) by covering with the palm of the hand(s) or by replacing the filter seal(s), inhale gently so that the facepiece collapses slightly, and hold the breath for ten seconds.

The design of the inlet opening of some cartridges cannot be effectively covered with the palm of the hand. The test can be performed by covering the inlet opening of the cartridge with a thin latex or nitrile glove and covers the intakes with his hands. If the facepiece remains slightly collapsed and no inward leakage of air is noted, the face seal is considered satisfactory.


Positive Pressure Test - Close off the exhalation valve with the palm of the hand and exhale gently into the facepiece. For most respirators this method of leak testing requires the wearer to first remove the exhalation valve cover before closing off the exhalation valve and then carefully replacing it after the test. The fit is considered satisfactory if a slight positive pressure can be maintained inside the facepiece and there is no evidence of outward leakage.

Another facepiece shall be selected and retested if the test subject fails the facepiece positive and or negative pressure tests.

3) Irritant Smoke Test

Upon completion of the negative and positive pressure tests, an irritant smoke test or other test as permitted by OSHA regulations will be performed. (NOTE: The appropriateness of the irritant smoke test is in question due to the high concentrations of acid-like smoke that is created. Consult the OSHA regulations, Regional Safety Coordinator or Corporate Director of Health and Safety for acceptable alternatives.)

This qualitative fit test uses a person's response to the irritating chemicals released in the "smoke" produced by a stannic chloride ventilation smoke tube (MSA Ventilation Smoke Tube, No. 458481 or equivalent) to detect leakage into the respirator.

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For this protocol, the respirator must be equipped with HEPA filters. No form of test enclosure or hood shall be used for this fit test.


The smoke can be irritating to the eyes, lungs and nasal passages. The test conductor shall take precautions to minimize the employee's exposure to the irritant smoke. Care shall be taken when performing the sensitivity screening checks so that only the minimum amount of smoke necessary to elicit a response from the employee is used. The fit test shall be conducted in an area with adequate ventilation to prevent exposure of the person conducting the fit test.

Sensitivity Screening Check - The employee must demonstrate his/her ability to detect a weak concentration of the irritant smoke. The test conductor shall inform the employee that the smoke can be irritating to the eyes, lungs and nasal passages and instruct the employee to keep his/her eyes closed during the test.

The employee shall be allowed to smell a weak concentration of the irritant smoke before the respirator is donned to become familiar with its irritating properties and to determine if he/she can detect the irritating properties of the smoke. The test conductor shall carefully direct a small amount of the irritant smoke in the employee's direction to determine he/she can detect it.

Irritant Smoke Fit Test Procedure – The employee being fit tested shall don the respirator without assistance, and perform the positive and negative pressure checks. The employee will be instructed to keep his/her eyes closed while the test is performed. The test conductor shall direct a stream of smoke toward the faceseal area of the employee using a squeeze bulb.

The test conductor shall begin 12 inches from the facepiece and move the smoke stream around the whole perimeter of the mask. The conductor shall gradually make two more passes around the perimeter of the mask, moving to within six inches of the respirator. If the employee being tested has not had an involuntary response and/or detected the irritant smoke, proceed with the test exercise.

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The test conductor will continually challenge the respirator facesal with smoke while the employee performs the following exercises:


- Normal Breathing. In a normal standing position, without talking, the employee shall breath normally (one minute).
- Deep Breathing. In a normal standing position, the subject shall breathe slowly and deeply, taking caution not to hyperventilate (one minute).
- Turn the head from side to side between the extreme positions on each side. Take a breath each time the head is turned to either side (one minute).
- Move the head up and down, but be sure not to bump the chest. Take a breath while the head is in the full upright position (one minute).
- Talking. The employee shall talk out loud slowly and loud enough so as to be heard clearly by the test conductor. The employee can read from a prepared text such as the rainbow passage, count backward from 100, etc.

RAINBOW PASSAGE - *When the sunlight strikes raindrops in the air, they act like a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch, with its path high above, and its two ends apparently beyond the horizon. There is, according to legend, a boiling pot of gold at one end. People look, but no one ever finds it. When a man looks for something beyond reach, his friends say he is looking for the pot of gold at the end of the rainbow.*

- Bending Over. The employee shall bend at the waist as if he/she were to touch his/her toes (one minute).
- Normal Breathing. In a normal standing position, without talking, the employee shall breath normally (one minute).

The respirator fit will be considered unacceptable if the employee detects the irritant smoke (involuntary cough, irritation) at any time during the test. If a satisfactory fit cannot be obtained, then another respirator will be selected and the entire fit testing protocol repeated.

Each employee passing the irritant smoke test without evidence of a response (involuntary cough, irritation) shall be given a second sensitivity screening check, with the smoke from the

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same smoke tube used during the fit test, once the respirator has been removed, to determine whether he/she still reacts to the smoke. Failure to evoke a response shall void the fit test.

If the response is produced during this second sensitivity check, then the fit test is passed.

4) Respirator Fit Test Record

Upon successful completion of the fit test procedure, the test instructor will fill out a Respirator Fit Test & Training Record (Appendix 27-2). The original form will be maintained in the employee's health and safety file.

5.10.1.3 APR Individual Issue


Respirators will be assigned to employees individually for their exclusive use and their names will be marked indelibly on the face piece. Exchanging respirators between employees is unacceptable unless proper fit testing is done and unless the respirator is cleaned and disinfected.

5.10.1.4 APR Use

Once an employee has received a medical clearance and proper training, and an appropriate respirator has been selected and passed the fit testing procedure, the employee is ready to use the respirator at a work site.

The following restrictions shall apply to all employees utilizing air-purifying respirators:

- 1) In order to achieve a good face to facepiece seal and eliminate interference with valve function, ATC employees will be clean shaven when wearing a respirator. **No beards, long sideburn, long mustaches, or stubble will be permitted.**
- 2) Respirators will not be worn by anyone with a condition that interferes with the face to facepiece seal or valve function.
- 3) If an employee wears corrective glasses or goggles, they will be worn in a manner that does not interfere with the seal of the facepiece to the face. **Contact lenses will not be permitted any time when wearing a respirator.**

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- 4) No clothing, facelets, or coverings will be permitted between the face and the facepiece. Coverall hoods and head coverings will be put on over the respirator.
- 5) The employee shall leave the respirator use area:
 - a) To wash their faces and respirator facepiece as necessary to prevent eye or skin irritation associated with the respirator use; or
 - b) If the employee detects vapor or gas breakthrough, changes in breathing resistance, or leakage of the facepiece; or
 - c) To replace the respirator or the filter, cartridge, or canister elements.
- 6) If the employee detects vapor or gas breakthrough, changes in breathing resistance, or leakage of the facepiece, the employee will replace the filters, cartridges, or canister elements or clean the respirator and conduct a positive and negative pressure check prior to returning to the work area.


If the condition persists, the employee shall notify his/her supervisor and an evaluation of the respirator and fit will be conducted.

- 7) The employee will periodically review monitoring results for active work sites such as asbestos removal sites, lead removal sites, and hazardous waste / petroleum release sites. Results of the daily monitoring conducted at asbestos or lead removal projects or direct reading instruments at hazardous waste / petroleum release sites will be utilized by the employee to determine if the level of protection being utilized is adequate. Any questions or concern should be directed to the employee's supervisor, project manager, safety officer or the Corporate Director of Health and Safety.

5.10.1.5 APR Cleaning

Respirators issued and utilized by a single employee shall be cleaned and disinfected as frequently as necessary to be maintained in a sanitary condition.

As a minimum requirement, respirators shall be cleaned and disinfected on a weekly basis. Respirators worn by more than one employee, those maintained for emergency use and those used for training and fit testing shall be cleaned and disinfected after each use.

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ATC personnel shall follow the manufactures instructions for cleaning and disinfecting or use the following procedures:


- 1) Remove cartridges and filters along with any gasket and seals not affixed to their seats.
- 2) Loosen strap adjustments completely.
- 3) Remove the exhalation valve cover.
- 4) Remove the exhalation valve and inhalation valves.
- 5) Wash the facepiece and other components in a warm (43 deg. C [110 deg.F] maximum) solution of detergent/sanitizer and water. Use a scrub brush to remove any gross contamination.
- 6) If the detergent used does not contain a disinfectant/sanitizer, respirator components will be immersed for two minutes in one of the following:
 - a) Hyperchlorite solution (50 ppm chlorine) made by adding approximately one milliliter of laundry bleach to one liter of warm water; or
 - b) A commercially available disinfectant recommended by the respirator manufacture.
- 7) Rinse all parts thoroughly in warm, clean, preferably running water. Drain.
- 8) Allow parts to air dry.
- 9) Use a damp, lint-free cloth to remove any soap or other foreign materials from the facepiece, valves, and seating surfaces.
- 10) Reassemble the respirator.
- 11) Test the respirator to ensure all components work properly.

5.10.1.6 Respirator Storage

After cleaning and drying the APR, it will be placed in a clean ziplock bag and stored in a location that will protect them from damage, extreme heat/cold, sunlight, excessive moisture and damaging chemicals. The respirators will be stored in a manner to prevent distortion of the facepiece and exhalation valve.

In addition to the above requirements, respirators to be utilized in emergencies shall be:

- 1) Kept accessible to the work area;
- 2) Stored in compartments or locations that are clearly marked as containing emergency respirators; and
- 3) Stored in accordance with any applicable manufactures instructions.


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5.10.1.7 Inspection and Maintenance

Prior to using an APR, the employee shall inspect the unit for signs of wear and contamination. Specifically, the following items should be inspected:

- 1) Facepiece - check for:
 - excessive dirt (clean dirt from facepiece)
 - cracks, tears, or holes (obtain new facepiece)
 - distortion (allow facepiece to "sit-free" from any constraints and see if distortion disappears; if not, obtain new facepiece)
 - cracked, scratched, or loose fitting lenses (contact respirator manufacturer to see if replacement is possible; otherwise, obtain new facepiece)
- 2) Headstraps - check for:
 - breaks or tears (replace headstraps)
 - loss of elasticity (replace headstraps)
 - broken or malfunctioning buckles or attachments (obtain new buckles)
- 3) Inhalation valve, exhalation valve - check for:
 - detergent residue, dust particles, or dirt on valve or valve seat (clean residue with soap and water)
 - cracks, tears, or distortion in the valve material or valve seat (obtain replacement valves from manufacturer)
 - missing or defective valve cover (obtain valve cover from manufacturer)
- 4) Filter element(s) - check for:
 - proper filter for the hazard
 - approval designation
 - missing or worn gaskets (contact manufacturer for replacement)
 - worn threads - both filter threads and facepiece threads (replace filter or facepiece, whichever is applicable)

All respirators maintained for use in emergency situations shall be inspected at least monthly as described above and in accordance with the manufacture's recommendations. These respirators will also be checked for proper function before and after each use.

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The emergency use respirators shall be certified by documenting the date the monthly inspections were performed, the name (or signature) of the person who made the inspection, the findings, required remedial action, and serial number or other means of identifying the inspected respirator.

This information will be provided on a tag or label that is attached to the storage compartment for the respirator, is kept with the respirator, or is included in inspection reports stored as paper or electronic files. This information shall be maintained until replaced following a subsequent inspection.

Any respirators found to have defective parts will immediately be taken out of service. Replacement parts for any respirator shall ONLY be the respirator manufacture's NIOSH-approved parts designed for that respirator.

5.10.1.8 Replacement of Filters or Cartridges

Only cartridges or filters approved by NIOSH shall be used in environments with known specific airborne contaminants.

Filters shall be changed whenever an increase in breathing resistance is detected.


Cartridges/canisters not equipped with an end-of-service-life indicator (ESLI) shall be changed at the end of each eight (8) hour work shift. Any signs of chemical breakthrough (i.e., odors, taste, irritation, etc.) shall indicate the need for replacement of the cartridges.

The cartridge/canister change schedule is based on the "Rule of Thumb" found in OSHA's website and supporting test data from MSA's Cartridge Change Test Program. This test data is relied upon as ATC's work rate falls in the normal to light range and concentrations of chemical exposure are consistently below 100 parts per million on a time-weighted basis.

5.10.2 Self-Contained Breathing Apparatus (SCBA)

5.10.2.1 Selection and Usage

Self-contained breathing apparatus is the most protective respiratory device available. An SCBA may be used for respiratory protection

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when the type and concentration of the hazardous atmosphere is unknown or when the limitations of an APR are exceeded.

A full facepiece pressure-demand SCBA certified by NIOSH for a minimum service life of 30 minutes is the most protective type available and is the only SCBA that will be utilized by ATC employees.


SCBAs shall be used by ATC upon entering a hazardous atmosphere confined space, IDLH atmosphere, or when making an initial site entry with unknown hazards. No IDLH or confined space atmosphere shall be entered by ATC personnel until other efforts have been made to reduce or eliminate the hazardous atmosphere by engineering controls (i.e., ventilation, etc.).

In areas where the wearer, with failure of the respirator, could be overcome by toxic or oxygen-deficient atmosphere (IDLH atmosphere), at least one additional person will be present outside the IDLH atmosphere. Communications (visual, voice, or signal line) shall be maintained between both or all individuals present.

Planning shall be such that one individual will be unaffected by any likely incident and have the proper rescue equipment and training to be able to assist the other(s) in case of emergency. Branch Safety Officer or designee must be notified before the employee(s) outside the IDLH atmosphere enter the IDLH atmosphere to provide emergency rescue.

Branch Safety Officer or designee, once notified, will provide necessary assistance appropriate to the situation. The employee(s) outside the IDLH atmosphere will be equipped with the following:

- 1) Pressure demand SCBA or a pressure demand or other positive pressure supplied air respirator with auxiliary SCBA; and either
- 2) Appropriate retrieval equipment for removing the employee(s) who enter these hazardous atmospheres where retrieval equipment would contribute to the rescue of the employee(s) and would not increase the overall risk resulting from entry; or
- 3) Equivalent means for rescue where retrieval equipment would increase the overall risk resulting from the rescuers entry.

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SCBAs shall be used only by ATC personnel who have had specific instruction and hands-on training in the use (routine and emergency), care, and limitations of the devices.

5.10.2.2 SCBA Fit Testing Procedure

Fit testing procedures for SCBA shall be the same as those for APRs. The fit testing shall be accomplished by temporarily converting the respirator facepiece into a negative pressure respirator with appropriate filters or by using an identical negative pressure air-purifying respirator facepiece with the same sealing surfaces as a surrogate for the SCBA. Refer to section 9.4.2 for specific fit test procedures.


5.10.2.3 SCBA Inspection Procedure

Prior to using an SCBA, each employee must conduct a thorough inspection of the unit to ensure that it is fully functional and will provide total respiratory protection. SCBA's shall be inspected on a monthly basis with records of inspection dates and findings maintained with the SCBA.

- 1) Preliminary Inspection - The employee shall check and ensure that the high pressure hose connector is tight on the cylinder fitting. The bypass valve and mainline valve should be securely closed. Careful attention should be directed to assuring that the regulator outlet is uncovered and free of any dirt, debris, or obstruction. The air tank should be filled to 2200 psi.
- 2) Backpack and Harness Assembly - The backpack and harness assembly shall be visually inspected for completeness and signs of wear and tear. The straps should be carefully inspected for signs of fraying or other damage. Missing parts or damaged straps should be replaced before use.

The buckles should be inspected to assure that they have mating ends and properly lock.

The backplate should be inspected for signs of cracking or missing rivets or screws. Visually inspect the cylinder strap for completeness and signs of damage. Physically tighten and lock the strap to ensure it is fully functional.


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- 3) Cylinder and Cylinder Valve Assembly - Check the cylinder to ensure it is securely fastened to the backplate. Make sure the hydrostatic test date is stamped on the neck of the cylinder and that the date is less than three years old for fiberglass wrapped aluminum bottles and five years old for steel bottles. Visually inspect the cylinder for large dents or pitted surface.
- 4) Head and Valve Assembly - Visually inspect the cylinder valve for damage. Slowly open the valve and listen or feel for leakage around the packaging. Check the cylinder gauge to ensure it is functional and that the needle, face, and lens are not badly damaged. Note any malfunction or damage and report the discrepancy to responsible personnel for corrective action before use.
- 5) Regulator and High Pressure Hose - Open the cylinder valve and listen or feel for leakage from the hose or at the hose-to-cylinder connection. Check the high pressure hose for signs of bubbling, punctures, or tears.

Check the alarm by placing the palm of the hand over the regulator outlet while opening the mainline valve. The regulator gauge should read at least 1800 psi. Close the valve and slowly release the pressure by slightly raising the palm of the hand. Observe the gauge to see that the pressure slowly drops. The low pressure alarm should sound between 650 psi to 550 psi. Completely close the valve once the pressure is relieved.

The diaphragm should be tested by applying a positive pressure through the regulator outlet for five to ten seconds. The positive pressure should be maintained without any loss of air. Create a negative pressure for five to ten seconds in the regulator. The vacuum should remain constant. Any loss of pressure or vacuum indicates a faulty diaphragm.

Open the cylinder valve. Place the palm of the hand over the regulator outlet and open the mainline valve. Remove the hand from the outlet and replace at least twice. Air should escape when the hand is removed, indicating a positive pressure in the chamber. Close the mainline valve and remove the hand from the outlet.

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Check the regulator outlet for obstructions or foreign materials.
Open and close the bypass valve to ensure it is functional.

- 6) Facepiece and Breathing Tube - Visually inspect the facepiece harness for signs of damage and/or deterioration. Inspect the facepiece for signs of distortion, deterioration, or damage. Inspect the lens for proper seal with the facepiece, presence of the retaining clamps, or any cracks or scratches. Check the exhalation valve for signs of deterioration, damage, or build-up of foreign materials.


Inspect the breathing tube by stretching it and looking for holes, signs of deterioration, or other damage. Make sure the tube is not visibly contaminated. Check the connector for the "O" ring or rubber gasket.

A negative pressure check should be completed on the facepiece. The facepiece should be donned properly and the palm of the hand held over the breathing tube. Inhale and maintain a negative pressure inside the facepiece for five to ten seconds. The facepiece should collapse inwardly and remain. Loss of the negative pressure indicates the facepiece is not adequate and should not be worn.

5.10.2.4 SCBA Cleaning

SCBAs shall be cleaned and disinfected as frequently as necessary to ensure proper protection is maintained. As a minimum requirement, the SCBAs should be cleaned and disinfected at least after each day's use. In the absence of any manufacturer's instructions, ATC personnel shall use the following procedures:

- 1) Use a mild, warm detergent solution to sponge off and wipe down the tank, backpack harness, and regulator. Do not get cleaning solution in the regulator. Do not dunk, soak, or hose it off.
- 2) Detach the breathing hose from the facepiece. Wash the breathing hose and facepiece in a bucket containing warm water and mild detergent and disinfectant. The facepiece will not normally require disassembly. Rinse both in warm, clean water at least twice.
- 3) Allow both the facepiece and breathing hose to air dry.
- 4) Reassemble the respirator.

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5.10.2.5 SCBA Storage

After cleaning and drying the SCBA, it should be placed in its designated case and stored in an area away from heat, sunlight, cold, dust, and damaging chemicals. Ensure that the following conditions are met when placing the unit in its case:

- 1) The air cylinder is recharged and the unit cleaned and inspected.
- 2) The cylinder valve is in the closed position.
- 3) The high pressure hose is securely connected to the cylinder.
- 4) No pressure should be left in the high pressure hose and regulator.
- 5) The bypass and mainline valves should be closed.
- 6) All of the harness straps are loosened and laid straight.
- 7) The facepiece should have the adjustment straps in the back of the facepiece. It should be placed in a ziplock bag to avoid contact with foreign contaminants.

In addition to the above, emergency use SCBA shall be kept accessible to the work area, stored in compartments or locations that are clearly marked as containing an emergency respirator, and stored in accordance with the manufacturers instructions.

5.10.2.6 Maintenance of the SCBA


In the event that an SCBA fails an inspection, is damaged or begins to malfunction, an authorized service center for the SCBA manufacturer should be contacted. ATC employees should never attempt to repair the regulator assembly. The entire SCBA should be scheduled for a routine maintenance check annually.

A separate log shall be kept for each SCBA unit (reference Appendix 27-4).

5.10.2.7 Air Quality

ATC shall use only Grade D breathing air of the highest purity as specified in the Compressed Gas Association Commodity Specifications G-7.1 (ANSI Z86.1-1989). The following air criteria shall be met:

- Oxygen: 19.5-23.5%
- Total Hydrocarbons: 5 ppm or less
- Carbon Monoxide: 10 ppm or less

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- Carbon Dioxide: 1000 ppm or less
- No pronounced odor

Pure oxygen shall not be used at any time in SCBAs or air-line systems.

5.10.3 Air-Line Respirators

An air-line respirator system may be used as an alternative to an SCBA when a high level of respiratory protection is needed. ATC employees shall use only pressure-demand air-line systems equipped with 5-minute emergency escape air supplies.

Such units can be used in confined spaces, IDLH atmospheres, and initial site entry situations. Only cascade systems of compressed breathing air shall be used as the air supply. Compressors allow the possibility of contaminated materials entering the air-line when used at a hazardous waste site.


ATC personnel shall enter no IDLH or confined space atmosphere until other efforts have been made to reduce or eliminate the hazardous atmosphere by engineering controls (i.e., ventilation, etc.).

In areas where the wearer, with failure of the respirator, could be overcome by toxic or oxygen-deficient atmosphere (IDLH atmosphere), at least one additional person will be present outside the IDLH atmosphere. Communications (visual, voice, or signal line) shall be maintained between both or all individuals present.

Planning shall be such that one individual will be unaffected by any likely incident and have the proper rescue equipment and training to be able to assist the other(s) in case of emergency. Branch Safety Officer or designee must be notified before the employee(s) outside the IDLH atmosphere enter the IDLH atmosphere to provide emergency rescue.

Branch Safety Officer or designee, once notified, provide necessary assistance appropriate to the situation. The employee(s) outside the IDLH atmosphere will be equipped with the following:

- 1) Pressure demand SCBA or a pressure demand or other positive pressure supplied air respirator with auxiliary SCBA; and either
- 2) Appropriate retrieval equipment for removing the employee(s) who enter these hazardous atmospheres where retrieval equipment would

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contribute to the rescue of the employee(s) and would not increase the overall risk resulting from entry; or

- 3) Equivalent means for rescue where retrieval equipment would increase the overall risk resulting from the rescuers entry.

Persons using air line respirators in atmospheres immediately dangerous to life or health shall be equipped with safety harnesses and safety lines for lifting or removing persons from hazardous atmospheres or other equivalent provisions for the rescue of persons from hazardous atmospheres shall be used.

Air-line systems shall be used only by ATC personnel who have had specific instruction and hands-on training in the use (routine and emergency), care, and limitations of air-line respirator systems.

Procedures for **fit testing, inspections, cleaning, storage and maintenance** of air-line respirators shall be the same as those found in sections 5.10.2.2 through 5.10.2.6.

A separate log shall be kept for each air-line respirator unit (reference Appendix 27-5).

5.10.3.1 Air Quality


Air quality utilized for air-line respirator systems shall be Grade D or better as outlined in Section 5.10.2.7.

In addition, the compressor shall be located in a “clean” atmosphere, with in-line purification and tagged to indicate date of last changeout. Carbon monoxide monitor shall be provided at the location of the clean air intake and set to alarm at 10 PPM or monitored frequently.

Air-line couplings shall be incompatible with outlets for other types of gas systems to prevent supplying air-line respirators with non-respirable gases or oxygen. The air pressure at the hose connection to positive-pressure respiratory equipment shall be within the range specified by the manufacturer.

5.10.3.2 Cascade System Requirements

Cascade systems shall be equipped with low pressure warning bells or a similar device to indicate that the air pressure in the manifold has reached 500 psi. If the cascade is used to supply breathing air, a safety standby person shall be assigned to monitor the low pressure alarm.

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If the cascade system is used to recharge SCBA air cylinders, it shall be equipped with a high pressure supply hose with a coupling rated at a capacity for at least 3000 psi.

All air-line respiratory systems and their parts shall be NIOSH/MSHA approved.

5.11 Employee Voluntary Use Activity

Employees who voluntarily utilize respirators in work sites where exposure does not warrant use, or who uses their own respirator shall be provided with information on this activity covered in Appendix 27-6, (Voluntary Respirator Usage Form) and document their knowledge and understanding of the information covered therein. Employees who desire to wear tight fitting respirators (excluding dust masks) voluntarily shall first gain approval from the Branch Safety Officer and shall comply with the requirements of the ATC Respiratory Protection Policy including:

- Initial Medical Evaluation
- Selection of Respirator
- Respirator Fit Testing
- Respirator Training

The local Branch Manager will determine who bears the costs associated with the voluntary respirator use.

6.0 References

OSHA 29 CFR 1910.134

OSHA 29 CFR 1910.1000

ANSI Z88.2 1969

ANSI Z88.2 1980

ANSI Z88.6 1984

NIOSH Guide to Industrial Respiratory Protection (Published 1987)



Appendix 27-5

Air Line Respirator Inspection/Maintenance Log

<div style="display: flex; justify-content: space-between;"><div>Department: _____</div><div>Equipment ID Number: _____</div></div> <div style="display: flex; justify-content: space-between; margin-top: 10px;"><div>Storage Location: _____</div><div>Year Purchased: _____</div></div>		
Date	Inspector	Type of Inspection/Maintenance
INSPECTION CHECKLIST Check: <div style="display: flex; flex-wrap: wrap;"><div style="width: 50%;"><ul style="list-style-type: none">1. Face Piece/Hood2. Exhalation Valve3. Head Harness4. Face Piece Hose5. Regulator6. Body Harness7. Cleaning8. Compressor Inlet9. Air Filters/Absorbents</div><div style="width: 50%;"><ul style="list-style-type: none">10. Compressor Failure Alarm11. Overheating Alarm12. Carbon Monoxide Alarm13. Carbon Monoxide Check14. Compressed-Air Line15. Other: _____ _____</div></div>		



Appendix 27-4

SCBA Inspection / Maintenance Log

<div style="display: flex; justify-content: space-between;"><div>Department: _____</div><div>Equipment ID Number: _____</div></div> <div style="display: flex; justify-content: space-between; margin-top: 10px;"><div>Storage Location: _____</div><div>Year Purchased: _____</div></div>		
Date	Inspector	Type of Inspection/Maintenance
INSPECTION CHECKLIST Check: <div style="display: flex; flex-wrap: wrap;"><div style="width: 50%;">1. Face Piece/Hood</div><div style="width: 50%;">7. High Pressure Hose</div><div style="width: 50%;">2. Exhalation Valve</div><div style="width: 50%;">8. Alarm</div><div style="width: 50%;">3. Head Harness</div><div style="width: 50%;">9. Cylinder Pressure</div><div style="width: 50%;">4. Face Piece Hose</div><div style="width: 50%;">10. Cleaning</div><div style="width: 50%;">5. Body Harness</div><div style="width: 50%;">11. Other: _____</div><div style="width: 50%;">6. Regulator</div></div>		



Appendix 27-3

Respirator Selection, Inventory and Authorized Users List

Date: _____

Location: _____

Respirator Selection

√	Activity	Minimum Respiratory Protection *	Specific Brand(s) and Models(s)
	Asbestos – Sampling, Class II & Class III Work Areas Lead – Manual demolition, manual scraping, manual sanding, power tools cleaning with dust collection systems	Half-mask air-purifying respirator, other than a disposable respirator, that is equipped with high-efficiency filters	
	Asbestos – Class I Work Areas and for employee's choice for Class II and III Work Areas	Tight-fitting powered air-purifying respirator equipped with high efficiency filters	
	Site Work (e.g., tank pulls, sampling of suspect hazardous materials, hazardous materials remediation, etc.)	In accordance with site-specific health and safety plan. Generally, minimum respiratory protection may require Half-mask air-purifying respirator, equipped with combination organic vapor cartridge and high-efficiency filters	
	Other (Describe)		
	Other (Describe)		

* Required respiratory protection may increase in accordance with actual exposures and OSHA requirements. If the initial evaluation cannot be accomplished, then the exposure shall be considered as immediately dangerous to life and health (IDLH), and only appropriate Class A or Class B respiratory protection shall be utilized until specific sampling and/or testing can be conducted to confirm employee exposure which shall be documented on this form.



Authorized Users

Users:	Name	Employee No.	Approved Respirator Class	Medical Approval
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				



Appendix 27-2

RESPIRATOR FIT TEST & TRAINING RECORD

Employee Name (Please Print): _____

Office Location: _____

Social Security #: _____

Job Title: _____

Prescription Glasses Required: Yes _____ No _____

Test 1 Respirator Manufacturer/Type/Model/Size: _____

Initial Fit OK: Yes _____ No _____

Negative Pressure Test Yes _____ No _____

Positive Pressure Test Yes _____ No _____

Irritant Smoke Test Yes _____ No _____

Sweetener Test Yes _____ No _____

Isoamyl Acetate Test Yes _____ No _____

Test 2 Respirator Manufacturer/Type/Model/Size: _____

Initial Fit OK: Yes _____ No _____

Negative Pressure Test Yes _____ No _____

Positive Pressure Test Yes _____ No _____

Irritant Smoke Test Yes _____ No _____

Sweetener Test Yes _____ No _____

Isoamyl Acetate Test Yes _____ No _____

Test 3 Respirator Manufacturer/Type/Model/Size: _____

Initial Fit OK: Yes _____ No _____

Negative Pressure Test Yes _____ No _____

Positive Pressure Test Yes _____ No _____

Irritant Smoke Test Yes _____ No _____

Sweetener Test Yes _____ No _____

Isoamyl Acetate Test Yes _____ No _____

Manufacturer/Type/Model/Size of respirator selected and fitted: _____

I understand that I am responsible for and agree to:

- Regular use of my respirator whenever there is a possibility I may be exposed to air contaminants
- Doing a positive/negative pressure fit test whenever I use a cartridge/filter respirator
- Cleaning, inspection and proper storage of my respirator at the end of each workday
- Reporting respirator malfunctions to my supervisor

Training Provided:

☐ Respirator Use ☐ Inspection

☐ Maintenance ☐ Cleaning

☐ Types and Levels of Contaminants

☐ Emergency Procedures/Drills

☐ How to fit

Employee Signature

Date

Tester's Signature

Date



Appendix 27-1

Respirator Medical Evaluation Letter to Physician

TO _____, M.D.	DATE _____
EMPLOYEE _____	SOC.SEC. NO. _____
JOB _____	WORK AREA _____

Please examine this employee, who will be using respiratory protection, to determine that he/she is physically able to perform the work and use the equipment. The employee will be fitted with the correct type(s) of NIOSH approved respirator(s) for the chemicals and tasks.

This employee may be exposed to the following chemicals:

Regular respirator(s) in use will consist of:

- | | |
|-----------------------------------------------|-----------------------------------------|
| <input type="checkbox"/> Half Mask | <input type="checkbox"/> Full face mask |
| <input type="checkbox"/> Disposable dust mask | <input type="checkbox"/> Other: _____ |

The respirator will be used _____ hours per day, _____ days per week.

Confined-space entry is: ☐ a part of job ☐ not part of the job

Emergency respirators that may be needed:

- ☐ SCBA ☐ Gas Mask for escape ☐ "Chlorine sucker" ☐ Other _____

The employee will be doing (light, moderate, heavy) labor.

After the examination, please answer the questions below and return this form with the completed medical evaluation questionnaire to the employee.

1. Is this employee physically able to perform the work while using the required respiratory equipment?
2. Are there any restrictions for this employee regarding the wearing of a respirator?

Further Questions: _____
Safety Officer Phone _____

Respiratory Medical Evaluation Questionnaire

The following information must be provided by everyone who has been selected to use any type of respirator (please print). This questionnaire shall be completed during normal working hours, or at a time and place that is convenient to you. Completion of this form is required by regulations and shall be provided to the health care professional when evaluated. To maintain your confidentiality, no one will review your answers, but this information is required by regulation to be maintained. As such, it will be kept confidential. You will be instructed as to how to deliver or send this questionnaire to the health care professional who will review it.

Part A, Section 1, Please Print.

1. Today's date: _____
2. Your name: _____
3. Your age (to nearest year) _____
4. Sex (circle one): Male/Female
5. Your height: _____ Ft. _____ in.
6. Your weight: _____ lbs.
7. Your job title: _____
8. A phone number where you can be reached by the health care professional who reviews this questionnaire (include the area code):

9. The best time to phone you at this number: _____
10. Has your employer told you how to contact the health care professional who will review this questionnaire (circle one): Yes/No
11. Check the type of respirator you will use (you can check more than one category):
 - a. _____ N, R, or P disposable respirator (filter-mask, non-cartridge type only).
 - b. _____ Other type (for example, half or full-facepiece type, powered-air purifying, supplied-air, self-contained breathing apparatus).
12. Have you ever worn a respirator (circle one): Yes/No
If yes, what type(s): _____

Part A. Section 2. (please circle "yes" or "no").

1. Do you currently smoke tobacco, or have you smoked tobacco in the last month: Yes/No
2. Have you ever had any of the following conditions?
 - a. Seizures (fits): Yes/No
 - b. Diabetes (sugar disease): Yes/No
 - c. Allergic reactions that interfere with your breathing: Yes/No
 - d. Claustrophobia (fear of closed-in places): Yes/No
 - e. Trouble smelling odors: Yes/No
3. Have you ever had any of the following pulmonary or lung problems?
 - a. Asbestosis: Yes/No
 - b. Asthma: Yes/No
 - c. Chronic bronchitis: Yes/No
 - d. Emphysema: Yes/No
 - e. Pneumonia: Yes/No
 - f. Tuberculosis: Yes/No

- g. Silicosis: Yes/No
 - h. Pneumothorax (collapsed lung): Yes/No
 - i. Lung cancer: Yes/No
 - j. Broken ribs: Yes/No
 - k. Any chest injuries or surgeries: Yes/No
 - l. Any other lung problem that you've been told about: Yes/No
4. Do you currently have any of the following symptoms of pulmonary or lung illness?
- a. Shortness of breath: Yes/No
 - b. Shortness of breath when walking fast on level ground or walking up a slight hill or incline: Yes/No
 - c. Shortness of breath when walking with other people at an ordinary pace on level ground: Yes/No
 - d. Have to stop for breath when walking at your own pace on level ground: Yes/No
 - e. Shortness of breath when washing or dressing yourself: Yes/No
 - f. Shortness of breath that interferes with your job: Yes/No
 - g. Coughing that produces phlegm (thick sputum): Yes/No
 - h. Coughing that wakes you early in the morning: Yes/No
 - i. Coughing that occurs mostly when you are lying down: Yes/No
 - j. Coughing up blood in the last month: Yes/No
 - k. Wheezing: Yes/No
 - l. Wheezing that interferes with your job: Yes/No
 - m. Chest pain when you breathe deeply: Yes/No
 - n. Any other symptoms that you think may be related to lung problems: Yes/No
5. Have you ever had any of the following cardiovascular or heart problems?
- a. Heart attack: Yes/No
 - b. Stroke: Yes/No
 - c. Angina: Yes/No
 - d. Heart Failure: Yes/No
 - e. Swelling in your legs or feet (not caused by walking): Yes/No
 - f. Heart arrhythmia (Heart beating irregularly): Yes/No
 - g. High blood pressure: Yes/No
 - h. Any other heart problem that you've been told about: Yes/No
6. Have you ever had any of the following cardiovascular or heart symptoms?
- a. Frequent pain or tightness in your chest: Yes/No
 - b. Pain or tightness in your chest during physical activity: Yes/No
 - c. Pain or tightness in your chest that interferes with your job: Yes/No
 - d. In the past two years, have you noticed your heart skipping or missing a beat: Yes/No
 - e. Heartburn or indigestion that is not related to eating: Yes/No
 - f. Any other symptoms that you think may be related to heart or circulation problems: Yes/No.
7. Do you currently take medication for any of the following problems:
- a. Breathing or lung problems: Yes/No
 - b. Heart trouble: Yes/No
 - c. Blood Pressure: Yes/No
 - d. Seizures (fits): Yes/No

8. If you've used a respirator, have you ever had any of the following problems? (If you've never used a respirator, check the following space and go question 9):
- a. Eye irritation: Yes/No
 - b. Skin allergies or rashes: Yes/No
 - c. Anxiety: Yes/No
 - d. General weakness or fatigue: Yes/No
 - e. Any other problem that interferes with your use of a respirator: Yes/No
9. Would you like to talk to the health care professional who will review this questionnaire about your answers to this questionnaire: Yes/No

Question 10 to 15 below shall be answered by everyone who has been selected to use either a full-facepiece respirator or a self-contained breathing apparatus (SCBA). For everyone else who has been selected to use other types of respirators, answering these questions is voluntary.

10. Have you ever lost vision in either eye (temporarily or permanently): Yes/No
11. Do you currently have any of the following vision problems?
- a. Wear contact lenses: Yes/No
 - b. Wear glasses: Yes/No
 - c. Color blind: Yes/No
 - d. Any other eye or vision problem: Yes/No
12. Have you ever had an injury to your ears, including a broken eardrum: Yes/No
13. Do you currently have any of the following hearing problems?
- a. Difficulty hearing: Yes/No
 - b. Wear a hearing aid: Yes/No
 - c. Any other hearing or ear problem: Yes/No
14. Have you ever had a back injury: Yes/No
15. Do you currently have any of the following musculoskeletal problems?
- a. Weakness in any of your arms, hands, legs or feet: Yes/No
 - b. Back pain: Yes/No
 - c. Difficulty fully moving your arms and legs: Yes/No
 - d. Pain or stiffness when you lean forward or backward at the waist: Yes/No
 - e. Difficulty fully moving your head up or down: Yes/No
 - f. Difficulty fully moving your head side to side: Yes/No
 - g. Difficulty bending at your knees: Yes/No
 - h. Difficulty squatting to the ground: Yes/No
 - i. Climbing a flight of stairs or a ladder carrying more than 25 lbs: Yes/No
 - j. Any other muscle or skeletal problem that interferes with using a respirator: Yes/No

Part B.

Any of the following questions, and other questions not listed, may be added to the questionnaire at the discretion of the health care professional who will review the questionnaire.

1. In your present job, are you working at high altitudes (over 5,000 feet) or in a place that has lower than normal amounts of oxygen: Yes/No

If “yes”, do you have feelings of dizziness, shortness of breath, pounding in your chest, or other symptoms when you’re working under these conditions: Yes/No
2. At work or at home, have you ever been exposed to hazardous solvents, hazardous airborne chemicals (e.g., gases, fumes, or dust), or have you come into skin contact with hazardous chemicals: Yes/No

If “yes”, name the chemicals if you know them: _____

3. Have you ever worked with any of the materials, or under any of the conditions, listed below:
 - a. Asbestos: Yes/No
 - b. Silica (e.g., Sandblasting): Yes/No
 - c. Tungsten/cobalt (e.g. grinding or welding this material): Yes/No
 - d. Beryllium: Yes/No
 - e. Aluminum: Yes/No
 - f. Coal (for example, mining): Yes/No
 - g. Iron: Yes/No
 - h. Tin: Yes/No
 - i. Dusty environments: Yes/No
 - j. Any other hazardous exposures: Yes/No
If “yes”, describe these exposures: _____

4. List any second jobs or side businesses you have: _____

5. List your previous occupations: _____

6. List your current and previous hobbies: _____

7. Have you been in the military services? Yes/No

If “yes”, were you exposed to biological or chemical agents (either in training or combat): Yes/No

8. Have you ever worked on a HAZMAT team? Yes/No
9. Other than medications for breathing and lung problems, heart trouble, blood pressure, and seizures mentioned earlier in this questionnaire, are you taking any other medications for any reason (including over-the-counter medications): Yes/No

If "yes", name the medications if you know them: _____

10. Will you be using any of the following items with your respirator(s)?
- a. HEPA Filters: Yes/No
 - b. Canisters (for example, gas masks): Yes/No
 - c. Cartridges: Yes/No
11. How often are you expected to use the respirator(s) (circle "yes" or "no" for all answers that apply to you)?:
- a. Escape only (no rescue): Yes/No
 - b. Emergency rescue only: Yes/No
 - c. Less than 5 hours per week: Yes/No
 - d. Less than 2 hours per day: Yes/No
 - e. 2 to 4 hours per day: Yes/No
 - f. Over 4 hours per day: Yes/No

12. During the period you are using the respirator(s), is your work effort:

- a. Light (less than 200 kcal per hour): Yes/No

If "yes", how long does this period last during the average shift: ____ hrs. ____ mins.

Examples of a light work effort are sitting while writing, typing, drafting, or performing light assembly work; or standing while operating a drill press (1-3 lbs) or controlling machines.

- b. Moderate (200 to 350 kcal per hour): Yes/No

If "yes", how long does this period last during the average shift: ____ hrs. ____ mins.

Examples of moderate work effort are sitting while nailing or filing; driving truck or bus in urban traffic; standing while drilling, nailing, performing assembly work, or transferring a moderate load (about 35 lbs.) at trunk level; walking on a level surface about 2 mph or down a 5-degree grade about 3 mph; or pushing a wheelbarrow with a heavy load (about 100 lbs.) on a level surface.

- c. Heavy (above 350 kcal per hour): Yes/No

If "yes", how long does this period last during the average shift: ____ hrs. ____ mins.

Examples of heavy work are lifting a heavy load (about 50 lbs.) from the floor to your waist or shoulder; working on a loading dock; shoveling; standing while bricklaying or chipping castings; walking up an 8-degree grade about 2 mph; climbing stairs with a heavy load (about 50 lbs.).

13. Will you be wearing protective clothing and/or equipment (other than the respirator) when you're using your respirator: Yes/No

If "yes", describe this protective clothing and/or equipment: _____

14. Will you be working under hot conditions (temperature exceeding 77° F): Yes/No

15. Will you be working under humid conditions: Yes/No

16. Describe the work you'll be doing while you're using your respirator(s): _____

17. Describe any special or hazardous conditions you might encounter when you're using your respirator(s) (for example, confined spaces, life-threatening gases): _____

18. Provide the following information, if you know it, for each toxic substance that you'll be exposed to when you're using your respirator(s):

Name of the first toxic substance: _____

Estimated maximum exposure level per shift: _____

Duration of exposure per shift: _____

Name of the second toxic substance: _____

Estimated maximum exposure level per shift: _____

Duration of exposure per shift: _____

Name of the third toxic substance: _____

Estimated maximum exposure level per shift: _____

Duration of exposure per shift: _____

The name of any other toxic substances that you'll be exposed to while using your respirator: _____

19. Describe any special responsibilities you'll have while using your respirator(s) that may affect the safety and well-being of others (for example, rescue, security): _____

Employee Certification

I certify to the best of my knowledge that all of the questions I have answered and statements I have made on this *Respirator Medical Evaluation Questionnaire* are correct and true to the best of my knowledge.

Employee Signature

Date

Employee Name (please print)

=====

Physician Certification

Based on my review of the *Respirator Medical Evaluation Questionnaire*, the named employee **is** / **is not** (please circle as applicable) qualified to wear the type respirator requested on page one of this document.

Licensed Health Care Professional Signature

Date

Licensed Health Care Professional Name (please print)



Appendix 27-6
Voluntary Respirator Use Form

Please Read:

Respirators are an effective method of protection against designated hazards when properly selected and worn. Respirator use is encouraged, even when exposures are below the exposure limit, to provide an additional level of comfort and protection. However, if a respirator is used improperly or not kept clean, the respirator itself can become a hazard to you. Sometimes employees may wear respirators to avoid exposures to hazards, even if the amount of hazardous substances does not exceed the limits set by OSHA standards. If respirators are provided to you by ATC Associates for your voluntary use, or if you provide your own respirator, you need to take certain precautions to be sure that the respirator itself does not present a hazard.

You should do the following:

1. Read and heed all instructions provided by the manufacturer on use, maintenance, cleaning and care, and warnings regarding the respirator's limitations.
2. Choose respirators certified for use to protect against the contaminant or concern. NIOSH, the National Institute for Occupational Safety and Health of the U.S. Department of Health and Human Services, certifies respirators. A label or statement of certification should appear on the respirator or respirator packaging. It will tell you what the respirator is designed for and how much it will protect you.
3. Do not wear your respirator into atmospheres containing contaminants for which your respirator is not designed to protect against. For example, a respirator designed to filter dust particles will NOT protect you against gases, vapors, or very small particles of fumes or smoke.
4. Keep track of your respirator so that you do not mistakenly use someone else's respirator.
5. Wearing of any tight-fitting respirator requires your participation in the ATC Respiratory Protection Program and must be first approved by the Branch Safety Officer and meet all of the applicable requirements of ATC Health & Safety Manual section (27) – Respiratory Protection.

By my signature below, I certify that I have read, understand and agree to the information provided on this form.

Signature

Printed Name

Date



Appendix 27-1

Respirator Medical Evaluation Letter to Physician

TO _____, M.D.		DATE _____
EMPLOYEE _____	SOC.SEC. NO. _____	
JOB _____	WORK AREA _____	

Please examine this employee, who will be using respiratory protection, to determine that he/she is physically able to perform the work and use the equipment. The employee will be fitted with the correct type(s) of NIOSH approved respirator(s) for the chemicals and tasks.

This employee may be exposed to the following chemicals:

Regular respirator(s) in use will consist of:

- ☐ Half Mask ☐ Full face mask
- ☐ Disposable dust mask ☐ Other: _____

The respirator will be used _____ hours per day, _____ days per week.

Confined-space entry is: ☐ a part of job ☐ not part of the job

Emergency respirators that may be needed:

- ☐ SCBA ☐ Gas Mask for escape ☐ "Chlorine sucker" ☐ Other _____

The employee will be doing (light, moderate, heavy) labor.

After the examination, please answer the questions below and return this form with the completed medical evaluation questionnaire to the employee.

1. Is this employee physically able to perform the work while using the required respiratory equipment?
2. Are there any restrictions for this employee regarding the wearing of a respirator?

Further Questions: _____
Safety Officer Phone

Respiratory Medical Evaluation Questionnaire

The following information must be provided by everyone who has been selected to use any type of respirator (please print). This questionnaire shall be completed during normal working hours, or at a time and place that is convenient to you. Completion of this form is required by regulations and shall be provided to the health care professional when evaluated. To maintain your confidentiality, no one will review your answers, but this information is required by regulation to be maintained. As such, it will be kept confidential. You will be instructed as to how to deliver or send this questionnaire to the health care professional who will review it.

Part A, Section 1, Please Print.

1. Today's date: _____
2. Your name: _____
3. Your age (to nearest year) _____
4. Sex (circle one): Male/Female
5. Your height: _____ Ft. _____ in.
6. Your weight: _____ lbs.
7. Your job title: _____
8. A phone number where you can be reached by the health care professional who reviews this questionnaire (include the area code):

9. The best time to phone you at this number: _____
10. Has your employer told you how to contact the health care professional who will review this questionnaire (circle one): Yes/No
11. Check the type of respirator you will use (you can check more than one category):
 - a. _____ N, R, or P disposable respirator (filter-mask, non-cartridge type only).
 - b. _____ Other type (for example, half or full-facepiece type, powered-air purifying, supplied-air, self-contained breathing apparatus).
12. Have you ever worn a respirator (circle one): Yes/No
If yes, what type(s): _____

Part A, Section 2. (please circle "yes" or "no").

1. Do you currently smoke tobacco, or have you smoked tobacco in the last month: Yes/No
2. Have you ever had any of the following conditions?
 - a. Seizures (fits): Yes/No
 - b. Diabetes (sugar disease): Yes/No
 - c. Allergic reactions that interfere with your breathing: Yes/No
 - d. Claustrophobia (fear of closed-in places): Yes/No
 - e. Trouble smelling odors: Yes/No
3. Have you ever had any of the following pulmonary or lung problems?
 - a. Asbestosis: Yes/No
 - b. Asthma: Yes/No
 - c. Chronic bronchitis: Yes/No
 - d. Emphysema: Yes/No
 - e. Pneumonia: Yes/No
 - f. Tuberculosis: Yes/No

- g. Silicosis: Yes/No
 - h. Pneumothorax (collapsed lung): Yes/No
 - i. Lung cancer: Yes/No
 - j. Broken ribs: Yes/No
 - k. Any chest injuries or surgeries: Yes/No
 - l. Any other lung problem that you've been told about: Yes/No
4. Do you currently have any of the following symptoms of pulmonary or lung illness?
- a. Shortness of breath: Yes/No
 - b. Shortness of breath when walking fast on level ground or walking up a slight hill or incline: Yes/No
 - c. Shortness of breath when walking with other people at an ordinary pace on level ground: Yes/No
 - d. Have to stop for breath when walking at your own pace on level ground: Yes/No
 - e. Shortness of breath when washing or dressing yourself: Yes/No
 - f. Shortness of breath that interferes with your job: Yes/No
 - g. Coughing that produces phlegm (thick sputum): Yes/No
 - h. Coughing that wakes you early in the morning: Yes/No
 - i. Coughing that occurs mostly when you are lying down: Yes/No
 - j. Coughing up blood in the last month: Yes/No
 - k. Wheezing: Yes/No
 - l. Wheezing that interferes with your job: Yes/No
 - m. Chest pain when you breathe deeply: Yes/No
 - n. Any other symptoms that you think may be related to lung problems: Yes/No
5. Have you ever had any of the following cardiovascular or heart problems?
- a. Heart attack: Yes/No
 - b. Stroke: Yes/No
 - c. Angina: Yes/No
 - d. Heart Failure: Yes/No
 - e. Swelling in your legs or feet (not caused by walking): Yes/No
 - f. Heart arrhythmia (Heart beating irregularly): Yes/No
 - g. High blood pressure: Yes/No
 - h. Any other heart problem that you've been told about: Yes/No
6. Have you ever had any of the following cardiovascular or heart symptoms?
- a. Frequent pain or tightness in your chest: Yes/No
 - b. Pain or tightness in your chest during physical activity: Yes/No
 - c. Pain or tightness in your chest that interferes with your job: Yes/No
 - d. In the past two years, have you noticed your heart skipping or missing a beat: Yes/No
 - e. Heartburn or indigestion that is not related to eating: Yes/No
 - f. Any other symptoms that you think may be related to heart or circulation problems: Yes/No.
7. Do you currently take medication for any of the following problems:
- a. Breathing or lung problems: Yes/No
 - b. Heart trouble: Yes/No
 - c. Blood Pressure: Yes/No
 - d. Seizures (fits): Yes/No

8. If you've used a respirator, have you ever had any of the following problems? (If you've never used a respirator, check the following space and go question 9):

- a. Eye irritation: Yes/No
- b. Skin allergies or rashes: Yes/No
- c. Anxiety: Yes/No
- d. General weakness or fatigue: Yes/No
- e. Any other problem that interferes with your use of a respirator: Yes/No

9. Would you like to talk to the health care professional who will review this questionnaire about your answers to this questionnaire: Yes/No

Question 10 to 15 below shall be answered by everyone who has been selected to use either a full-facepiece respirator or a self-contained breathing apparatus (SCBA). For everyone else who has been selected to use other types of respirators, answering these questions is voluntary.

10. Have you ever lost vision in either eye (temporarily or permanently): Yes/No

11. Do you currently have any of the following vision problems?

- a. Wear contact lenses: Yes/No
- b. Wear glasses: Yes/No
- c. Color blind: Yes/No
- d. Any other eye or vision problem: Yes/No

12. Have you ever had an injury to your ears, including a broken eardrum: Yes/No

13. Do you currently have any of the following hearing problems?

- a. Difficulty hearing: Yes/No
- b. Wear a hearing aid: Yes/No
- c. Any other hearing or ear problem: Yes/No

14. Have you ever had a back injury: Yes/No

15. Do you currently have any of the following musculoskeletal problems?

- a. Weakness in any of your arms, hands, legs or feet: Yes/No
- b. Back pain: Yes/No
- c. Difficulty fully moving your arms and legs: Yes/No
- d. Pain or stiffness when you lean forward or backward at the waist: Yes/No
- e. Difficulty fully moving your head up or down: Yes/No
- f. Difficulty fully moving your head side to side: Yes/No
- g. Difficulty bending at your knees: Yes/No
- h. Difficulty squatting to the ground: Yes/No
- i. Climbing a flight of stairs or a ladder carrying more than 25 lbs: Yes/No
- j. Any other muscle or skeletal problem that interferes with using a respirator: Yes/No

Part B.

Any of the following questions, and other questions not listed, may be added to the questionnaire at the discretion of the health care professional who will review the questionnaire.

1. In your present job, are you working at high altitudes (over 5,000 feet) or in a place that has lower than normal amounts of oxygen: Yes/No

If "yes", do you have feelings of dizziness, shortness of breath, pounding in your chest, or other symptoms when you're working under these conditions: Yes/No
2. At work or at home, have you ever been exposed to hazardous solvents, hazardous airborne chemicals (e.g., gases, fumes, or dust), or have you come into skin contact with hazardous chemicals: Yes/No

If "yes", name the chemicals if you know them: _____

3. Have you ever worked with any of the materials, or under any of the conditions, listed below:
 - a. Asbestos: Yes/No
 - b. Silica (e.g., Sandblasting): Yes/No
 - c. Tungsten/cobalt (e.g. grinding or welding this material): Yes/No
 - d. Beryllium: Yes/No
 - e. Aluminum: Yes/No
 - f. Coal (for example, mining): Yes/No
 - g. Iron: Yes/No
 - h. Tin: Yes/No
 - i. Dusty environments: Yes/No
 - j. Any other hazardous exposures: Yes/No
If "yes", describe these exposures: _____

4. List any second jobs or side businesses you have: _____

5. List your previous occupations: _____

6. List your current and previous hobbies: _____

7. Have you been in the military services? Yes/No

If "yes", were you exposed to biological or chemical agents (either in training or combat): Yes/No

8. Have you ever worked on a HAZMAT team? Yes/No
9. Other than medications for breathing and lung problems, heart trouble, blood pressure, and seizures mentioned earlier in this questionnaire, are you taking any other medications for any reason (including over-the-counter medications): Yes/No
- If "yes", name the medications if you know them: _____
-
10. Will you be using any of the following items with your respirator(s)?
- a. HEPA Filters: Yes/No
 - b. Canisters (for example, gas masks): Yes/No
 - c. Cartridges: Yes/No
11. How often are you expected to use the respirator(s) (circle "yes" or "no" for all answers that apply to you)?:
- a. Escape only (no rescue): Yes/No
 - b. Emergency rescue only: Yes/No
 - c. Less than 5 hours per week: Yes/No
 - d. Less than 2 hours per day: Yes/No
 - e. 2 to 4 hours per day: Yes/No
 - f. Over 4 hours per day: Yes/No
12. During the period you are using the respirator(s), is your work effort:
- a. Light (less than 200 kcal per hour): Yes/No
- If "yes", how long does this period last during the average shift: ____ hrs. ____ mins.
- Examples of a light work effort are sitting while writing, typing, drafting, or performing light assembly work; or standing while operating a drill press (1-3 lbs) or controlling machines.
- b. Moderate (200 to 350 kcal per hour): Yes/No
- If "yes", how long does this period last during the average shift: ____ hrs. ____ mins.
- Examples of moderate work effort are sitting while nailing or filing; driving truck or bus in urban traffic; standing while drilling, nailing, performing assembly work, or transferring a moderate load (about 35 lbs.) at trunk level; walking on a level surface about 2 mph or down a 5-degree grade about 3 mph; or pushing a wheelbarrow with a heavy load (about 100 lbs.) on a level surface.
- c. Heavy (above 350 kcal per hour): Yes/No
- If "yes", how long does this period last during the average shift: ____ hrs. ____ mins.
- Examples of heavy work are lifting a heavy load (about 50 lbs.) from the floor to your waist or shoulder; working on a loading dock; shoveling; standing while bricklaying or chipping castings; walking up an 8-degree grade about 2 mph; climbing stairs with a heavy load (about 50 lbs.).

13. Will you be wearing protective clothing and/or equipment (other than the respirator) when you're using your respirator: Yes/No

If "yes", describe this protective clothing and/or equipment: _____

14. Will you be working under hot conditions (temperature exceeding 77° F): Yes/No

15. Will you be working under humid conditions: Yes/No

16. Describe the work you'll be doing while you're using your respirator(s): _____

17. Describe any special or hazardous conditions you might encounter when you're using your respirator(s) (for example, confined spaces, life-threatening gases): _____

18. Provide the following information, if you know it, for each toxic substance that you'll be exposed to when you're using your respirator(s):

Name of the first toxic substance: _____
Estimated maximum exposure level per shift: _____
Duration of exposure per shift: _____

Name of the second toxic substance: _____
Estimated maximum exposure level per shift: _____
Duration of exposure per shift: _____

Name of the third toxic substance: _____
Estimated maximum exposure level per shift: _____
Duration of exposure per shift: _____

The name of any other toxic substances that you'll be exposed to while using your respirator: _____

19. Describe any special responsibilities you'll have while using your respirator(s) that may affect the safety and well-being of others (for example, rescue, security): _____

Deleted: _

Employee Certification

I certify to the best of my knowledge that all of the questions I have answered and statements I have made on this *Respirator Medical Evaluation Questionnaire* are correct and true to the best of my knowledge.

Employee Signature

Date

Employee Name (please print)

=====

Physician Certification

Based on my review of the *Respirator Medical Evaluation Questionnaire*, the named employee **is** / **is not** (please circle as applicable) qualified to wear the type respirator requested on page one of this document.

Licensed Health Care Professional Signature

Date

Licensed Health Care Professional Name (please print)



Appendix 27-2

RESPIRATOR FIT TEST & TRAINING RECORD

Employee Name (Please Print): _____

Office Location: _____

Social Security #: _____

Job Title: _____

Prescription Glasses Required: Yes _____ No _____

Test 1 Respirator Manufacturer/Type/Model/Size: _____

Initial Fit OK: Yes _____ No _____

Negative Pressure Test Yes _____ No _____

Positive Pressure Test Yes _____ No _____

Irritant Smoke Test Yes _____ No _____

Sweetener Test Yes _____ No _____

Isoamyl Acetate Test Yes _____ No _____

Test 2 Respirator Manufacturer/Type/Model/Size: _____

Initial Fit OK: Yes _____ No _____

Negative Pressure Test Yes _____ No _____

Positive Pressure Test Yes _____ No _____

Irritant Smoke Test Yes _____ No _____

Sweetener Test Yes _____ No _____

Isoamyl Acetate Test Yes _____ No _____

Test 3 Respirator Manufacturer/Type/Model/Size: _____

Initial Fit OK: Yes _____ No _____

Negative Pressure Test Yes _____ No _____

Positive Pressure Test Yes _____ No _____

Irritant Smoke Test Yes _____ No _____

Sweetener Test Yes _____ No _____

Isoamyl Acetate Test Yes _____ No _____

Manufacturer/Type/Model/Size of respirator selected and fitted: _____

I understand that I am responsible for and agree to:

- Regular use of my respirator whenever there is a possibility I may be exposed to air contaminants
- Doing a positive/negative pressure fit test whenever I use a cartridge/filter respirator
- Cleaning, inspection and proper storage of my respirator at the end of each workday
- Reporting respirator malfunctions to my supervisor

Training Provided:

☐ Respirator Use ☐ Inspection

☐ Maintenance ☐ Cleaning

☐ Types and Levels of Contaminants

☐ Emergency Procedures/Drills

☐ How to fit

Employee Signature

Date

Tester's Signature

Date



Appendix 27-3

Respirator Selection, Inventory and Authorized Users List

Date: _____

Location: _____

Respirator Selection

√	Activity	Minimum Respiratory Protection *	Specific Brand(s) and Models(s)
	Asbestos – Sampling, Class II & Class III Work Areas Lead – Manual demolition, manual scraping, manual sanding, power tools cleaning with dust collection systems	Half-mask air-purifying respirator, other than a disposable respirator, that is equipped with high-efficiency filters	
	Asbestos – Class I Work Areas and for employee's choice for Class II and III Work Areas	Tight-fitting powered air-purifying respirator equipped with high efficiency filters	
	Site Work (e.g., tank pulls, sampling of suspect hazardous materials, hazardous materials remediation, etc.)	In accordance with site-specific health and safety plan. Generally, minimum respiratory protection may require Half-mask air-purifying respirator, equipped with combination organic vapor cartridge and high-efficiency filters	
	Other (Describe)		
	Other (Describe)		

* Required respiratory protection may increase in accordance with actual exposures and OSHA requirements. If the initial evaluation cannot be accomplished, then the exposure shall be considered as immediately dangerous to life and health (IDLH), and only appropriate Class A or Class B respiratory protection shall be utilized until specific sampling and/or testing can be conducted to confirm employee exposure which shall be documented on this form.



Authorized Users

Users:	Name	Employee No.	Approved Respirator Class	Medical Approval
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				



Appendix 27-4

SCBA Inspection / Maintenance Log

<div style="display: flex; justify-content: space-between;"><div>Department: _____</div><div>Equipment ID Number: _____</div></div> <div style="display: flex; justify-content: space-between; margin-top: 10px;"><div>Storage Location: _____</div><div>Year Purchased: _____</div></div>		
Date	Inspector	Type of Inspection/Maintenance
INSPECTION CHECKLIST Check: <div style="display: flex; flex-wrap: wrap;"><div style="width: 50%;">1. Face Piece/Hood</div><div style="width: 50%;">7. High Pressure Hose</div><div style="width: 50%;">2. Exhalation Valve</div><div style="width: 50%;">8. Alarm</div><div style="width: 50%;">3. Head Harness</div><div style="width: 50%;">9. Cylinder Pressure</div><div style="width: 50%;">4. Face Piece Hose</div><div style="width: 50%;">10. Cleaning</div><div style="width: 50%;">5. Body Harness</div><div style="width: 50%;">11. Other: _____</div><div style="width: 50%;">6. Regulator</div></div>		



Appendix 27-5

Air Line Respirator Inspection/Maintenance Log

<div style="display: flex; justify-content: space-between;"><div>Department: _____</div><div>Equipment ID Number: _____</div></div> <div style="display: flex; justify-content: space-between; margin-top: 10px;"><div>Storage Location: _____</div><div>Year Purchased: _____</div></div>		
Date	Inspector	Type of Inspection/Maintenance
INSPECTION CHECKLIST Check: <div style="display: flex; flex-wrap: wrap;"><div style="width: 50%;"><ul style="list-style-type: none">1. Face Piece/Hood2. Exhalation Valve3. Head Harness4. Face Piece Hose5. Regulator6. Body Harness7. Cleaning8. Compressor Inlet9. Air Filters/Absorbents</div><div style="width: 50%;"><ul style="list-style-type: none">10. Compressor Failure Alarm11. Overheating Alarm12. Carbon Monoxide Alarm13. Carbon Monoxide Check14. Compressed-Air Line15. Other: _____</div></div>		



Appendix 27-6
Voluntary Respirator Use Form

Please Read:

Respirators are an effective method of protection against designated hazards when properly selected and worn. Respirator use is encouraged, even when exposures are below the exposure limit, to provide an additional level of comfort and protection. However, if a respirator is used improperly or not kept clean, the respirator itself can become a hazard to you. Sometimes employees may wear respirators to avoid exposures to hazards, even if the amount of hazardous substances does not exceed the limits set by OSHA standards. If respirators are provided to you by ATC Associates for your voluntary use, or if you provide your own respirator, you need to take certain precautions to be sure that the respirator itself does not present a hazard.

You should do the following:


1. Read and heed all instructions provided by the manufacturer on use, maintenance, cleaning and care, and warnings regarding the respirator's limitations.
2. Choose respirators certified for use to protect against the contaminant or concern. NIOSH, the National Institute for Occupational Safety and Health of the U.S. Department of Health and Human Services, certifies respirators. A label or statement of certification should appear on the respirator or respirator packaging. It will tell you what the respirator is designed for and how much it will protect you.
3. Do not wear your respirator into atmospheres containing contaminants for which your respirator is not designed to protect against. For example, a respirator designed to filter dust particles will NOT protect you against gases, vapors, or very small particles of fumes or smoke.
4. Keep track of your respirator so that you do not mistakenly use someone else's respirator.
5. Wearing of any tight-fitting respirator requires your participation in the ATC Respiratory Protection Program and must be first approved by the Branch Safety Officer and meet all of the applicable requirements of ATC Health & Safety Manual section (27) – Respiratory Protection.

By my signature below, I certify that I have read, understand and agree to the information provided on this form.

Signature

Printed Name

Date

	Employee Health & Safety Policy Manual	Policy Section #:	25
		Page:	1 of 8
	Subject:	Revision:	01
	Personal Protective Equipment (PPE)	Issue Date:	04-20-2007

1.0 Policy

Employees shall use appropriate personal protective equipment (PPE) as determined by hazard assessments, training, and local requirements.

This policy covers minimum performance standards applicable to all ATC Associates employees and locations. Local practices requiring more detailed or stringent rules, or local, state or other federal requirements regarding this subject can and should be added as an addendum to this procedure as applicable.

2.0 Purpose

To establish a specific procedure for the control, use, and care of personal protective clothing and equipment.

3.0 Scope

Applies to all ATC work sites, i.e., ATC Offices, client job sites, etc., and includes visitors, vendors, and subcontractors.

4.0 Definitions

General Use PPE - means any PPE that is generally issued to employees for a work site for known exposures.

PPE - is an abbreviated term for "Personal Protective Equipment".


ANSI - is an abbreviated term for the "American National Standards Institute".

5.0 Requirements

5.1 PPE Hazard Assessment

Prior to personal protective equipment being selected and distributed for ATC location or work sites, a Hazard Assessment shall be performed by a Competent Person. The Hazard Assessment shall be completed for each specific task or work area utilizing Appendix 25-01, the completed ATC Site Health and Safety Plan (HASP) or an equivalent document. The Hazard Assessment shall be communicated to each affected employee.

The Safety Officer, Branch Manager, Regional Safety Coordinator or the Corporate Safety Manager must approve and certify the Hazard Assessment.

	Employee Health & Safety Policy Manual	Policy Section #:	25
		Page:	2 of 8
	Subject:	Revision:	01
	Personal Protective Equipment (PPE)	Issue Date:	04-20-2007

This Hazard Assessment will then become a local addendum to this Policy and be maintained on file at the Branch office or work site.

A PPE Hazard Assessment shall be conducted whenever there is a change in operations, processes, machinery or any other conditions that may promote, create or produce any potential physical or health hazard.

Specific classes (Class A, B, C, or D) of PPE may be required for site which may trigger OSHA Hazardous Waste Operations and Emergency Response (HAZWOPER) regulatory requirements. For more information, refer to Policy 35.

5.2 Assignment of PPE

The appropriate items of PPE from the Hazard Assessment shall be selected by the ATC Branch Safety Officer and assigned/issued by the Supervisor and/or the Site Safety Officer to each employee.

Required PPE shall be provided to employees at no charge, except for PPE that is so personal or unique to the individual employee that ATC deems it impractical for other employees to re-use (examples include safety footwear and prescription safety eyewear). Employee owned or provided personal protective equipment is not allowed unless specifically reviewed and approved in writing by the Branch Safety Officer.

PPE is to be made available to each employee for controlling exposures to applicable hazards. PPE must be made available in appropriate sizes in order to ensure proper fit for affected employee use.


The first and foremost means of protecting employees from injuries or exposures is to eliminate the exposure. The general hierarchy for controlling potential exposures is: (1) Engineering Controls; (2) Administrative Controls; and (3) the use of PPE. PPE is a means of preventing injury or exposure when exposure elimination and/or other control means are not feasible.

PPE must be provided, used and maintained in a sanitary and reliable condition. Defective and/or damaged PPE shall not be used.

5.3 Employee Training

5.3.1 Initial

Prior to first use of PPE, new employees shall be trained on the following:

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- When PPE is necessary
- What PPE is necessary
- Proper fit of PPE (selecting appropriate size)
- How to properly put on (don), take off (doff), adjust, and wear PPE
- The limitations of the PPE; and
- The proper care, maintenance, useful life and disposal of the PPE

5.3.2 Refresher Training

Refresher training of individual employees shall occur when any of the following occur:

- Changes in the work site render previous training obsolete
- Changes in the types of PPE to be used render previous training obsolete
- Inadequacies in the employee's knowledge or use of assigned PPE indicate that the employee has not retained an understanding or skill of PPE use

5.3.3 Certification of Training

Employees receiving training outlined in 5.3.1 and 5.3.2 of this Manual section shall certify their receipt and understanding of this training. The following information shall be documented with this certification:


- Name of each employee
- Date(s) of training
- Identification of the PPE subject

5.4 Head Protection

Potential head hazards include: Injury to the head from falling objects; bumps to the head due to low clearance workplace obstructions, such as nails in attic environments; and piping in industrial and service environments.

Hard hats shall be in compliance with or exceed ANSI Standard Z89.1. Criteria to be considered when purchasing hard hats shall include:

- Compatibility to welding hoods
- Compatibility with earmuffs, splash goggles, face shields, etc.
- Comfort for the wearer

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- Ratchet suspension

Bump caps and metallic hardhats are prohibited.

Approved hardhats shall be worn in general construction, drilling, service or otherwise designated hard hat areas.

Stickers, decals or other modifications to hard hats shall be approved prior to use by the Safety Officer and shall meet established company branding protocols.

For questions concerning head protection, consult with the Branch Safety Officer or Regional Safety Coordinator.

5.5 Eye/Face Protection

Potential eye hazards include: Flying particles; molten metal; liquid chemicals; acid or caustic liquids; chemical gases or vapors; and potentially injurious light radiation.

Special consideration must be given when work involves the use of, or close proximity to, pressurized liquids and/or gases. This includes grouting operations, the use of Hydro-Vac and Air-Knife equipment, and similar activities.

Safety glasses, goggles, and face shields shall meet ANSI Standard Z87.1. ANSI approval is distinguished on the frame and/or on the lens (Z87.1).


Approved eye protection shall be worn in general construction, drilling, service or otherwise designated eye protection areas. Approved face protection shall be worn as required by the hazard assessment.

Only those sunglasses approved by ANSI Z 87.1 are permitted on work sites.

Non-prescription safety glasses shall have side-shields permanently attached. Prescription glasses shall meet ANSI Standard Z 87.1 or ANSI-approved glasses/goggles shall be used over non-ANSI approved prescription glasses.

The cost of obtaining ANSI approved prescription lenses is the responsibility of the employee, subject to local Branch reimbursement/cost share programs and any Corporate Policies and guidance. ATC Branches shall indicate this through an Addendum to this Policy.

Employees shall wear ANSI-approved safety glasses or goggles whenever using face shields and welding hoods.

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For questions concerning eye protection, consult with the Branch Safety Officer or Regional Safety Coordinator.

5.6 Hand Protection

Potential hand exposures include: Hazards of skin absorption of harmful substances; severe cuts or lacerations; severe abrasions; punctures; chemical burns; thermal burns' and harmful temperature extremes.

Approved hand protection shall be worn in general construction, drilling, service or otherwise designated hand protection areas. The appropriate form of hand protection shall be worn as determined by the PPE hazard assessment.

Specialty hand protection shall utilized for certain activities, including work with sharp materials or cutting tools, chemicals/solvents, and work in close proximity to potentially energized electrical circuits. For questions concerning hand protection, consult with the Branch Safety Officer or Regional Safety Coordinator.

5.7 Work Clothing

Employees shall wear appropriate work clothing that is suitable for the activities involved. Long pants or coveralls are required. Chemical protective clothing, as determined by the PPE hazard assessment, shall be utilized as appropriate.


In some specific Client environments, such as chemical plants, bulk petroleum terminals, or refining operations, flame-retardant clothing (such as Nomex) may be required.

For questions concerning work clothing and general body protection, consult with the Branch Safety Officer or Regional Safety Coordinator.

5.8 Hearing Protection

When hearing protection is utilized or required, various types and styles of hearing protection shall be made available for employee selection and use.

In the event that hearing protection is required, the protection chosen must have the ability to reduce the employee noise exposure below the OSHA Permissible Exposure Limit (PEL). The Noise Reduction Rating (NRR) will indicate the amount of reduction provided by the specific hearing protection equipment. This rating is provided on the packaging for the hearing protection devices.

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The NRR is a general rating that assumes consistent and very effective application (fit) of the hearing protection device. This will be minimized due to personal fitting of the device, environmental conditions, and other factors. Therefore, the general rule (Best Management Practice) for determining the actual NRR is to subtract seven (7) from the NRR, then divide the result by two (2). For example, if the NRR on the packaging is 30, subtract 7, and then divide by 2 for an effective Noise reduction level of 11.5. The key is to get the protection to or below 90 dBA (preferably 85 or less). Refer to Policy No. 34, Hearing Conservation, for more details on hearing and noise.

For questions concerning hearing protection, consult with the Branch Safety Officer or Regional Safety Coordinator.

5.9 Fall Protection

Refer to Policy No. 17, Fall Protection.

5.10 Foot Protection


Potential foot hazards include: Falling or rolling objects; objects piercing the sole; wet environments; chemical hazards; and where the employee's feet are exposed to electrical hazards.

Footwear shall be determined in accordance with the PPE Hazard Assessment.

Footwear (non-project site) must provide good foot support and surface contact area to minimize the potential for trips and falls. High heel shoes should be avoided.

Footwear (project site) must be selected based upon both the environment of use and the activities to be engaged in. For environments where the walking surface will be paved and even, safety shoes or lower cut boots may be appropriate. In environments such as a construction site, where the walking and working surfaces may be uneven, and even contain rocks and clumps of dirt, higher cut boots are more appropriate. Additionally, climbing and performing activities where there are significant changes in working surface elevation, higher top boots are more appropriate to provide support for ankles.

Protective safety footwear shall meet the requirements and specifications of ANSI Z41 or the American Society for Testing & Materials (ASTM). Currently,

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safety shoe manufacturers are adhering to ASTM Standards and eventually, the OSHA regulation may be updated to reflect this.

For questions concerning foot protection, consult with the Branch Safety Officer or Regional Safety Coordinator.

5.11 Respiratory Protection

Refer to Policy No. 27 (Respiratory Protection).

5.12 Minimum PPE Protection

For project site activities, certain minimum levels of PPE are required. Generally, this includes the use of approved:

- Hard hat;
- Safety glasses;
- Foot protection (safety toe footwear);
- Hand protection (general work gloves); and
- Appropriate work clothing.

The specific PPE for a given activity or project site must be specified in the Health and Safety Plan (HASP) and understood by all affected employees.


Depending upon the project site, additional PPE may be required, including but not limited to safety reflective vests where vehicular traffic is a consideration. For questions concerning minimum PPE, consult with the Branch Safety Officer or Regional Safety Coordinator.

PPE must meet the requirements for the OSHA Hazardous Waste Operations and Emergency Response (HAZWOPER) regulation as appropriate. This requires adherence to specific levels of PPE. Refer to 29CFR1910.120.

6.0 Appendices

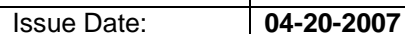
25-01 – PPE Hazard Assessment Certification (Form)


25-02 – PPE Travel Bag Contents (Form)

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6.1 References

- Occupational Safety and Health Administration (OSHA) 29 CFR Part 1910.132; 29 CFR Part 1926.28 (General Requirements).
- Occupational Safety and Health Administration (OSHA) 29 CFR Part 1910.133; 29 CFR Part 1926.102 (Eye & Face Protection).
- Occupational Safety and Health Administration (OSHA) 29 CFR Part 1910.136; 29 CFR Part 1926.96 (Foot Protection).
- Occupational Safety and Health Administration (OSHA) 29 CFR Part 1910.135; 29 CFR Part 1926.100 (Head Protection).
- Occupational Safety and Health Administration (OSHA) 29 CFR Part 1910.95; 29 CFR Part 1926.101 (Hearing Protection).
- Occupational Safety and Health Administration (OSHA) 29 CFR Part 1910.134; Part 1926.103 (Respiratory Protection).
- Occupational Safety and Health Administration (OSHA) 29 CFR Part 1910.138 (Hand Protection).
- Occupational Safety and Health Administration (OSHA) 29 CFR Part 1910.120 (Hazardous Waste Operations and Emergency Response).

[illegible]

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Employee Name _____ Employee Number _____
 Division _____ Supervisor: _____
 Branch No. _____ Branch Location _____

A. Required PPE

<input type="checkbox"/> Hard Hat	Model/Type: _____	Condition: <input type="checkbox"/> Good <input type="checkbox"/> Needs Replacement
<input type="checkbox"/> Safety Shoes/Boots	Model/Type: _____	Condition: <input type="checkbox"/> Good <input type="checkbox"/> Needs Replacement
<input type="checkbox"/> Safety Glasses	Model/Type: _____	Condition: <input type="checkbox"/> Good <input type="checkbox"/> Needs Replacement
<input type="checkbox"/> Respirator	Model/Type: _____	Condition: <input type="checkbox"/> Good <input type="checkbox"/> Needs Replacement
<input type="checkbox"/> Hearing Protection	Model/Type: _____ NRR: _____	Condition: <input type="checkbox"/> Good <input type="checkbox"/> Needs Replacement
<input type="checkbox"/> Gloves (General Work)	Model/Type: _____	Condition: <input type="checkbox"/> Good <input type="checkbox"/> Needs Replacement

B. Additional PPE

<input type="checkbox"/> Respirator	Model/Type: _____	Condition: <input type="checkbox"/> Good <input type="checkbox"/> Needs Replacement
<input type="checkbox"/> Reflective Vest	Model/Type: _____	Condition: <input type="checkbox"/> Good <input type="checkbox"/> Needs Replacement
<input type="checkbox"/> Coverall Goggles	Model/Type: _____	Condition: <input type="checkbox"/> Good <input type="checkbox"/> Needs Replacement
<input type="checkbox"/> Face Shield	Model/Type: _____	Condition: <input type="checkbox"/> Good <input type="checkbox"/> Needs Replacement
<input type="checkbox"/> Gloves (Specialty)	Model/Type: _____	Condition: <input type="checkbox"/> Good <input type="checkbox"/> Needs Replacement
<input type="checkbox"/> Coveralls	Model/Type: _____	Condition: <input type="checkbox"/> Good <input type="checkbox"/> Needs Replacement

Pre-Job Inspection by: _____ Date _____

Comments: _____


C. Other Items

☐ Lifelines Card
☐ Stop Work Card
☐ BBS Observation Cards
☐ Hazardous Materials Labels
☐ Do Not Operate tags (LO/TO or Faulty Equipment)

Pre-Job Inspection by: _____ Date _____

Comments: _____

This Checklist can be used as a self-check tool to confirm all needed items and to perform a self-audit of contents. It can also be used by the Supervisor for spot-checks of travel bags to ensure employees have necessary items and the condition of those items.

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1.0 Policy

Work activities requiring the use of approved ladders shall be conducted safely with associated exposures eliminated and/or controlled.

This policy covers minimum performance standards applicable to all ATC Associates employees and locations. Local practices requiring more detailed or stringent rules, or local, state or other federal requirements regarding this subject can and should be added as an addendum to this procedure as applicable.

2.0 Purpose

To define the requirements for the safe use of approved ladders.

3.0 Scope

Applies to all ATC Associates work sites, i.e., ATC offices, client job sites, etc.

4.0 Definitions

4.1 General Terms

ANSI - stands for the American National Standards Institute that provides ladder manufacturing guidelines.

Competent Person (for ladders) - means a person possessing the ability to identify hazardous or dangerous conditions and shall have the authorization to take prompt corrective measures to eliminate these conditions. A Competent Person shall know how to detect hidden defects, as well as the proper procedures to follow when equipment is found to be defective.


Cleat - means a means a ladder crosspiece of rectangular cross section placed on edge upon which a person may step while ascending or descending a ladder.

Ladder - means a tool usually consisting of two sides rails joined at regular intervals by cross-pieces called steps, or rungs, on which a person may step in ascending or descending.

Rungs/Steps - means ladder crosspieces on which a person steps when ascending or descending.

Tread - means the horizontal member of a step.

4.2 Fixed Ladder Terms

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Cage - means a guard that may be referred to as a cage or basket guard that is an enclosure that is fastened to the side rails of the fixed ladder or to the structure to encircle the climbing space of the ladder for the safety of the person who must climb the ladder.

Fastenings - means a device to attach a ladder to a structure, building, or equipment.

Fixed ladder - means a ladder permanently attached to a structure, building, or equipment. It cannot be readily moved or carried because it is an integral part of a building or structure.

Grab bars - means individual handholds placed adjacent to or as an extension above ladders for the purpose of providing access beyond the limits of the ladder.

Individual-rung ladder - means a fixed ladder each rung of which is individually attached to a structure, building, or equipment.

Ladder safety device - means any device, other than a cage or well, designed to eliminate or reduce the possibility of accidental falls and which may incorporate such features as harnesses/belts, friction brakes and sliding attachments.

Pitch - means the included angle between the horizontal and the ladder, measured on the opposite side of the ladder from the climbing side.


Rail ladder - means a fixed ladder consisting of side rails joined at regular intervals by rungs and fastened in full length or in sections to a building, structure, or equipment.

Railing - means is a vertical barrier erected along exposed edges of floor openings, wall openings, ramps, platforms, and runways to prevent falls of persons (Refer to Policy No. 17, Fall Protection).

Side-step ladder - means a ladder from which a person getting off at the top must step sideways from the ladder in order to reach the landing.

Through ladder - means a ladder from which a person getting off at the top must step through the ladder in order to reach the landing.

Well - means a permanent complete enclosure of at least three sides or gated around a fixed ladder, which is attached to the walls of the well. Proper clear-

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ances for a well will give the person who must climb the ladder the same protection as the cage.

4.3 Portable Ladder Terms

Decay - means disintegration, tearing, cracking, loose, etc.

Extension ladder - means a non-self-supporting portable ladder adjustable in length. It consists of two or more sections in guides or brackets that permit length adjustment. Length is designated by the sum of the lengths of the sections measured along the side rails.

Extension trestle ladder - means a self-supporting portable ladder, adjustable in length, consisting of a trestle ladder base and a vertically adjustable single ladder with means for the locking the ladders together. The length is designated by the length of the trestle ladder base.

Platform ladder - means a self-supporting ladder of fixed size with a platform at the working level.

Portable ladder - means a ladder that is not an integral part of a building or structure. Portable ladders can be readily moved or carried.

Sectional ladder - means a non-self-supporting portable ladder, nonadjustable in length, consisting of two or more sections that function as a single ladder. The length is designated by the overall length of the assembled sections.


Single ladder - means a single section non-self-supporting portable ladder, nonadjustable in length. The length is designated by the overall length of the side rail.

Stepladder - means a self-supporting portable ladder, nonadjustable in length, having flat steps and a hinged back. Length is designated by the overall length of the ladder measured along the front edge of the side rails.

Steps - mean the flat crosspieces of a stepladder on which a person steps when ascending or descending.

Tread width - means the horizontal distance from front to back of the tread including nosing.

Trestle ladder - means a self-supporting portable ladder, nonadjustable in length, consisting of two sections hinged at the top to form equal angles with the base with rungs on each side. The size is designated by the length of the side rails measured along the front edge.

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5.0 Requirements

5.1 Ladder Selection Criteria

The following table outlines the weight-capacity classifications for approved ladder types:

ANSI TYPE	APPLICATION	WORKING LOAD
IAA	Services/Shop/Warehouse	375 lbs. Maximum
IA	Services/Shop/Warehouse	300 lbs. Maximum

Only ANSI type IAA and IA ladder are approved.

Ladders of these types shall only be of fiberglass/non-conductive material. Wood or job-made ladders are discouraged and require approval by a Competent Person for use under special circumstances.

Any future-developed ladder with a rating higher in 'working load' capacity than the ANSI type IAA is acceptable.

5.2 Training


Designated Competent Person(s) shall provide training to applicable employees utilizing ladders, either separately or in conjunction with Fall Protection training (Refer to Policy No. 17, Fall Protection). Ladder training will be conducted for:

- Applicable new employees which will be oriented to the ATC Associates Ladder Procedure (and any local addendums) as part of the New Employee Orientation Program.
- At all new worksites, i.e., ATC offices, client job sites, etc., during the pre-job meeting to describe specific ladder requirements of the job.

Thereafter, every applicable employee will be trained at least annually either separately or in conjunction with Fall Protection training.

Training related to applicable ladders shall include:

- The nature of ladder hazards in the work site
- As applicable, the correct procedures for construction (job-made ladders), use, placement and care in handling all ladder types and styles

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- The maximum intended load-carrying capacities of all ladder types and styles
- Applicable standards contained in OSHA CFR 29 1926.1053 and those of this Policy

5.3 Inspections

Ladders shall be visually inspected before and after each use.

Ladder defects include, but are not limited to:

- Structural defects-such as bent, broken or missing rungs, cleats, or steps
- Broken or split rails
- Corroded components
- Other faulty or defective components

Such ladders shall be immediately removed from service and tagged with **“DANGEROUS-DO NOT USE”** (or comparable wording) sign/tag and immediately reported to the supervisor or a designated competent person

Such ladders are to be returned to the Branch for proper disposal or repair by personnel trained to manufacturers standards. This disposal shall involve cutting the ladder in two through all rungs parallel to the sides


When ladders are returned to the Branch for storage, they shall be thoroughly inspected before being released to another job. Ladders with defects shall be tagged for non-use if stored, then appropriately disposed of.

5.4 Ladder Use and Transportation

5.4.1 Choosing the Proper Ladder

Before a ladder is used, it shall be determined that a ladder is the best device to use. Scaffolds and mechanical lifts may be a better choice for certain situations. Once a ladder has been determined to be the best option, the proper ladder shall be chosen.

Ladders shall be chosen in accordance with the job to be performed. Choose ladders based on the ladders rated strength, usable height and load specification. The combined weight of the user, their tools and mate-

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rials shall not exceed the rating of the ladder. Each ladder shall have a duty rating displayed on a label affixed to the ladder.

The ladder chosen shall be inspected and found to be in good serviceable condition.

5.4.2 Transporting

Two employees should carry stepladders over 10 feet, and straight/extension ladders 20 feet or greater in length.

Any ladder less than ten feet (10') in length can be carried by one employee when supporting the ladder in the middle and to his/her side.

Ladders stored on/in vehicles shall be secured from movement at both ends. Materials used to secure such ladders shall be properly sized and inspected for decay before use and discarded if in disrepair.

Ladders projecting more than three (3) feet from the vehicle body shall be marked with a red 'flag'. Requirements for flagging and transport may vary by jurisdiction. For questions, contact the local authority such as the State Police.

5.4.3 Pre-Setup Rules


Ladders must be in good, serviceable condition before use. This includes ladder rungs, cleats, or steps that are parallel, level, and uniformly spaced when ladder is in position for use. Ladders shall be placed on firm, stable footing.

If the ladder is positioned by a door or walkway, ensure that the door is locked or the walkway is barricaded to prevent collisions.

Keep ladders at least ten feet (10') away from energized power lines (personnel shall be trained and instructed to watch for overhead power lines before erecting any ladder). You may require more clearance depending on the voltage contained in the lines. Refer to Policy No. 12, Electrical (General) for specific clearance requirements.

When using portable extension ladders, identify (before setup) the best location that allows for the proper securing of the ladder at the base and/or top.

If work is to be performed while employees are directly beneath the ladder, position the ladder away from the work, or contact your immediate supervisor to notify them of the situation before commencing work. Barri-

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ers and/or warnings should be posted while working on a ladder in any high-traffic areas.

5.4.4 Setup and Use

5.4.4.1 Portable Step Ladders

Ensure that the folding cross braces are locked in the proper position.

Ensure that the bottom areas of the ladder are kept clear and free of debris.

Ensure that a portable step ladder is not utilized as a straight or extension ladder (for example, leaning it against an object when climbing).

Place the top step directly under, or slightly in-front of, the intended work area.

It is a best practice to have someone hold any ladder over twelve feet (12') in height while ascending/descending/ performing work.


Where possible, do not work with the side rails facing the working surface.

Do not climb the backside of a ladder, nor straddle, stand, or sit on the top step.

5.4.4.2 Portable Straight and Extension Ladders

Place a straight or extension ladder at an angle of 4:1. For every 4 feet of height, the base of the ladder should be out 1 foot (i.e., one horizontal foot from the support point). With the ladder already leaning at an angle against the surface, place your feet at the feet of the ladder and extend your arms straight. Move the ladder until the point where the palms of your hands meet a rung. At this point the ratio should be approximately 4:1.

Ensure that both side rails make contact with the structure at the bearing point. If this is not possible, use a cross brace to distribute the load to both side rails.

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For ladders up to thirty-six feet (36') in length, ensure that the ladder extends at least three feet (3') (approximately three rungs) beyond the surface being accessed. Further overlap adds stability.

Ensure that a straight or extension ladder is not placed in a horizontal position as a substitute for a scaffold or a runway between two elevated locations.

Ensure that a straight or extension ladder is not placed directly against a windowpane or sash.

Ensure that the top and bottom areas of the ladder are kept clear and free of debris.

The top end of the ladder should extend 3 feet (3') above the upper landing and be tied off at the top to some secure point.

5.4.4.3 Fixed ladders

Ladders 24 feet and longer shall be provided with cages, wells, ladder safety devices, or self-retracting lifelines regardless of the climbing distance.

Top and bottom areas of the ladder should be kept clear and free of debris.


Ladder rungs shall be at least seven inches (7") from the wall to which the ladder is attached.

5.5 General Rules for Use of Any Style / Type Ladder

Ladders shall only be used as specified by the manufacturer.

Do not lean out from the ladder in any direction. Work on a ladder should be performed within the rails. This type of action could cause the user to lose balance and fall. With a properly positioned ladder the work should always be directly in front of or over you.

Use the 3-point rule when climbing up or down. At least two hands and one foot, or two feet and one hand, should be in contact with the ladder at all times.

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If three-point contact cannot be maintained on ladders, or if work must be performed outside the rails of the ladder with a fall exposure greater than or equal to 6', a suitable fall protection device must be provided. Refer to Policy No. 17, Fall Protection for specific requirements. Scaffolding may also be an appropriate alternative and could allow workers to be more efficient while working at height. Refer to Policy No. 28, Scaffolding

Face the ladder when ascending or descending.

If tools are needed, they should be carried in a tool belt or pulled up with a rope once the employee has reached his/her destination.

When ascending or descending, tools/equipment/supplies that cannot be readily carried in a tool pouch shall be handled by another employee on the ground or lowered/raised to/from the ground by the employee on the ladder once positioned safely on the ladder.

Do not jump from or onto a ladder. Do not slide down a ladder.

Remove any ice, snow, mud or other slippery substance from the rungs/steps.

Ladders cannot be moved, shifted or extended while employees are on them.

Do not store tools or materials on the top of ladders.

Wear slip resistance footwear for climbing/descending, such as work boots.


Do not use the top two steps of a portable stepladder and the top four rungs on other ladders. Those steps/rungs are necessary for balance only. Obtain a larger ladder if more height is needed.

Climb slowly with your weight centered between side rails.

Do not join two short ladders to make a longer one. The side rails will not be strong enough to support the extra load.

5.6 Maintenance and Storage

5.6.1 Maintenance

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Ladders should not be painted (other than for property marking) because paint may hide defects that could lead to ladder failure.

Ladders shall be kept clean and free of mud, dirt and grime.

5.6.2 Storage

Do not store ladders in such a way that they present a tripping hazard or could potentially fall on employees.

Keep ladders in areas where they will not come into contact with oil, grease or other slipping hazards.


Store and secure ladders in a safe and dry place, out of direct exposure to the sun and other weather elements whenever possible.

6.0 Appendices

24-01 – Portable Ladder Safety & Audit Checklist

7.0 References


- Occupational Safety and Health Administration (OSHA), 29 CFR Part 1926.1051, General Requirements
- Occupational Safety and Health Administration (OSHA), 29CFR Part 1926.1053, Ladders
- Occupational Safety and Health Administration (OSHA), 29 CFR Part 1926.1060, Training.

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Branch: _____ Ladder Location: _____ Inspection By: _____ Date: _____


NOTE: If any ladder is found to be in unsafe condition, tag it “Do Not Use” or similar wording until it can be repaired or replaced. Destroy damaged ladders to prevent others from using it while in unsafe condition.

	YES	NO	N/A	Comments
A. Inspection Guidelines for Portable Ladders (including Extension Ladders and Step Ladders)				
1. Wooden ladders are free of splinters, sharp edges, cracks or decay; Metal ladders are free of slivers, dents that would weaken ladder				
2. No rungs/steps are missing or damaged so as to make them unsafe				
3. Surfaces are free of mud, oil, grease, or slippery materials (Metal ladders - rungs must be corrugated, knurled, dimpled or coated with non-slip coating)				
4. Joints between steps and side rails are tight; rungs do not move when twisted by hand				
5. Hardware and fittings are securely attached				
6. Movable parts operate freely without binding or undue play				
7. Safety feet and other auxiliary equipment are in good condition				
8. No opaque coating which might obscure defects; labels on only one face of side rails				
9. Rope, if present, is in good condition (not frayed/badly worn)				
10. Spreader on step ladder is in good condition				
11. If determined to be defective, warning label is attached; ladder is taken out of service				
B. Ladder Use Safety Tips – Selection & Placement				
1. No overhead electrical lines or other electrocution hazards are in vicinity of use				
2. Metal ladder is NOT used for electrical work or near energized electrical circuits				
3. Ladder length does not exceed allowable limits (step ladder, 20'; single section ladder, 30'; 2-section metal ladder, 48'; metal ladder with more than 2 sections, 60')				
4. Ladder length is appropriate for the task (not too long; not too short)				
5. Ladder is set at proper angle and with both rails supported equally (4:1 standoff; with rungs parallel to ground)				
6. Ladder is not used as a guy, skid, scaffold, or any use other than intended purpose				
7. Ladder is properly placed to prevent slipping, lashed (tied-off), or held in position (step ladders have all 4 feet on firm footing)				
8. Ladder is placed only on stable base (no boxes, etc. used to gain height); Ladder does not lean to one side or wobble				

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NOTE: If any ladder is found to be in unsafe condition, tag it “Do Not Use” or similar wording until it can be repaired or replaced. Destroy damaged ladders to prevent others from using it while in unsafe condition.

	YES	NO	N/A	Comments
9. In traffic areas, measures are taken to prevent inadvertent displacement (doors locked or guarded prior to placing ladder in front of them, barricade around work area, etc.)				
10. When used to access a high landing or rooftop, top of ladder extends 3 feet above edge of landing				
C. Ladder Use Safety Tips – Climbing & Working				
1. Only one person on ladder at a time (do not exceed posted load limit)				
2. Face ladder when climbing				
3. Do not get on or off ladder from the side or back (if step ladder, do not use rear braces as steps unless so designed by the manufacturer)				
4. Maintain 3-point contact with ladder at all times when climbing				
5. If working from ladder, keep body aligned with center of steps/rungs and do not lean backwards				
6. If tools must be carried up a ladder, use a tool belt or equivalent (do not carry tools or equipment by hand)				
7. When ladders need to be moved or position adjusted, this should only be performed while no one is on the ladder				
D. Ladder Training				
1. Are all users trained in proper use, general maintenance, and hazards related to ladders?				

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1.0 Policy

Work sites shall be maintained to the standard of care appropriate for the industry with respects to health and safety.

This policy covers minimum performance standards applicable to all ATC Associates employees and locations. Local practices requiring more detailed or stringent rules, or local, state or other federal requirements regarding this subject can and should be added as an addendum to this procedure as applicable.

2.0 Purpose

To ensure that risk of personnel injury, environmental impact, and property damage are controlled for Industrial Hygiene-related issues.

3.0 Scope

Applies to all ATC Associates work sites, i.e., ATC offices, client job sites, etc.

4.0 Definitions

ACGIH - means the American Congress of Governmental Industrial Hygienists. This is a member-based organization that advances worker health and safety through education and the development and dissemination of scientific and technical knowledge.


ALARA - means As Low As Reasonably Achievable.

BEL - means Biological Exposure Indices. These are not standards, but guidelines established by the ACGIH designed for use by industrial hygienists in making decisions regarding safe levels of exposure to various chemical substances and physical agents found in the workplace.

IDLH - means Immediately Dangerous to Life or Health as established by the NIOSH-MSHA.

NIOSH - means the National Institutes of Occupational Safety and Health.

PEL - means permissible exposure limit. PELs are workplace regulatory limits established and enforced by OSHA on the amount or concentration of a substance in the air. They may also contain a skin designation.

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PPE - means personal protective equipment.

STEL - means short-term exposure limit as established by the ACGIH.

TLV - means threshold limit value. TLVs are not standards, but guidelines established by the ACGIH designed for use by industrial hygienists in making decisions regarding safe levels of exposure to various chemical substances and physical agents found in the workplace.

TWA - means Time-Weighted Average.

5.0 Requirements

5.1 General

Periodic worksite evaluations shall be made to determine the degree of employee exposure to chemical, physical, or biological agents.

Work areas shall be evaluated by the Branch Safety Officer, Site Safety Coordinator or other designated competent person (e.g. Industrial Hygienist).

Noise levels shall be controlled where feasible, so as to create and sustain a productive work place for the type of work being conducted (reference section 5.3 of this Policy).

Work environments involving extreme heat or cold shall be evaluated as necessary. Buddy systems, acclimatization programs, reduced rate of production, cessation of highly hazardous tasks, increased number of breaks, additional fluid supplements, warming trailers, etc. shall be considered, as appropriate.


5.2 Air Contaminants

5.2.1 General

Potential health hazards of air contaminants resulting from worksite operations shall be evaluated by the Branch Safety Officer or other designated competent person.

The Branch Safety Officer shall determine what air contaminants should be evaluated further through the use of Industrial Hygiene monitoring.

Any initial or baseline monitoring shall consist of air monitoring in representative locations within each worksite depending upon layout and

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repeated under varying conditions. Additionally, OSHA has developed substance specific regulations, found in 29 CFR Part 1910 (§ 1910.1000 to end), which has specific requirements for exposure monitoring and required frequency.

Changes to the work environment and the continuing effectiveness of engineering controls and PPE (Personal Protective Equipment) shall be determined through follow up monitoring.

Personal monitoring shall be utilized as necessary to meet specific OSHA requirements.

When the results of the air monitoring reveal air contaminants at concentrations equal to or greater than the PEL, engineering controls and/or administrative controls shall be implemented where feasible to reduce the contaminant level. If these controls are not feasible, ATC employees shall select and use appropriate PPE. Specific contaminants such as Benzene, Lead and H₂S have special Action Levels that are covered in the following sections.


5.2.2 Air Monitoring

Appendix 23-01 is a table summarizing the Action Level guidelines.

5.2.2.1 Ambient Air Monitoring

In an effort to assess potential employee exposure, determine appropriate levels of protective equipment, and establish specific work zones, ATC will perform ambient air monitoring at hazardous waste sites and in other hazardous situations such as during confined space entry. The type and degree of air monitoring will depend on the specific work activities and the known and suspected hazard(s) present. A site-specific monitoring plan will be developed as part of each Health and Safety Plan.

In most circumstances, direct reading instruments will be utilized to conduct general surveys for the presence of combustible gases and vapors, oxygen content, organic vapors and gases, and radiation. Other substances such as inorganic gases and vapors, and particulate matter, may also be monitored if deemed necessary. All monitoring shall be performed by, or under the direct supervision of the site safety officer.

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5.2.2.2 Combustible Gases and Vapors

A combustible gas indicator (CGI) or explosimeter will be utilized to determine the concentration of gases or vapors in an atmosphere as a percentage of the lower explosive limit (LEL). The LEL is the lowest concentration of gas or vapor in air by volume that will explode or burn when there is an ignition source.

It is the policy of ATC to prohibit entry or to cease operations in an atmosphere containing 10% or more of the LEL. If a reading of 10% of the LEL is recorded, employees must evacuate the work area until engineering controls or natural ventilation can reduce the concentration below 10% of the LEL. Even detectable readings on a CGI of less than 10% must be taken seriously and considered for the potential toxic hazards.

NOTE: Combustible gas indicators are not reliable in oxygen deficient atmospheres.


5.2.2.3 Oxygen

An oxygen detector must be utilized by ATC personnel to monitor upon entry and periodically, where conditions exist, for an oxygen deficient environment. Depending on altitude, the normal concentration of oxygen in air is approximately 20.8% by volume.

It is ATC policy (and an OSHA requirement) that no personnel shall enter an atmosphere or conduct any work in an atmosphere which contains an oxygen content equal to or less than 19.5% by volume unless equipped with a pressure demand self contained breathing apparatus or a supplied air respirator with an at least 5 minute escape bottle. Likewise, no personnel shall enter or work in an oxygen enriched atmosphere equal to or greater than 23.5% by volume.

5.2.2.4 Organic Vapors and Gases

Direct reading monitors that utilize photo or flame ionization detection systems shall be used to conduct general on-site surveys for the presence of airborne volatile organic vapors and gases. These devices have definite limitations in that they monitor only certain vapors and gases in the air and are non-specific in their results. Consequently, other devices such as colorimetric detector tubes, designed for specific compounds, may have to be utilized as well.

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Unlike combustible gases or oxygen, the Action Level for toxic gases and vapors is variable and dependent upon the permissible exposure limit (PEL) of the substance. The Action Levels for toxic vapors and gases will be determined prior to project start up and outlined in the Health and Safety Plan. When entering atmospheres containing unknown concentrations of toxic substances, it is ATC policy (and an OSHA requirement) that a Level B protection shall be used until more specific air monitoring can be done.

5.2.2.5 Radiation

The use of radiation survey meters to detect gamma, alpha, beta, and neutron radiation shall be used by ATC personnel when such contamination is suspected.

Normal background exposure levels are approximately equal to 0.01-0.02 milliroentgen per hour (mR/hr). It is the policy of ATC to prohibit entry or to cease operations in an atmosphere with radiation levels equal to or greater than 0.2 mR/hr. However, any exposures in excess of the background level warrants consultation with a health physicist.


When ATC employees are required to work near or in conjunction with a radioactive material source, consult with the Corporate Risk Management Department regarding use of an appropriate radiation dosimetry badge for the affected employee. Employees whom utilize either a Nuclear Density Gauge or a XRF should contact the local Radiation Safety Officer (RSO) for specific requirements. Refer to Policy No. 38 -Radiation Safety (Portable Gauge Devices) and Policy No. 39 Radiation Safety (XRF).

5.2.2.6 Inorganic Gases and Vapors

Photo and flame ionization detectors have limited capabilities for the detection of inorganic gases and vapors. Colorimetric detector tubes or special direct reading instruments should be used whenever a specific inorganic material such as hydrogen sulfide or hydrogen cyanide is suspected.

5.2.3 Personal Air Monitoring

It is ATC policy that only qualified Industrial Hygiene personnel or individuals with documented air sampling experience shall conduct personnel air sampling.

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In order to determine an employee's 8-hour Time-Weighted Average exposure to a specific chemical, personal air monitoring shall be conducted under the direction of a competent person at each Branch as assigned by the Branch Safety Officer. Results from employee exposure monitoring are compared to published permissible exposure limits in order to determine regulatory compliance and the degree of health risk to the worker(s).

Workers to be monitored will be selected based upon their work activity and potential for exposure. Generally, personnel working in the highest risk situations will be monitored. Personnel such as chemistry lab employees who routinely work with chemicals may be monitored to determine the extent of any chemical exposure.

The sampling procedure for personal air monitoring is unique from direct reading methods described previously. In most cases, samples are drawn by small air pumps from the breathing zone of the worker and captured on one of a variety of possible sample collection media. The sample collection device is then sent to an analytical lab for determination of chemical type and concentration. Upon receipt of results, the monitored employee(s) must be informed of the results and a copy of the results shall be placed in their health and safety file.


5.2.4 Instrument Calibration

All ambient and personal air sampling devices must be calibrated according to manufacturer recommended procedures immediately before use of the instrument. A verification of calibration should also be done immediately after use to see that the instrument has remained in calibration. General survey instruments must be checked daily on the project site to verify that the calibration is still valid.

These calibrations and verifications of sampling devices must be documented in the field log book and retained with the permanent office project file when the project is finished.

5.2.5 Ensuring Reliability of Test Equipment

Users of portable gas test equipment shall be trained in proper use, care, inspection and calibration requirements, and limitations of the equipment.

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Routine replacement of parts shall be performed in accordance with the manufacturer's written instructions by qualified personnel. All other repairs must be undertaken by the authorized service provider.

The Branch Safety Officer should be consulted prior to purchasing/renting a portable air monitor.

Portable gas test equipment that is available for service but has not been used within the past 30 days should be inspected as described below. A record of these checks shall be maintained at the work site or Branch Office and be available for review upon request.

Each test equipment holder shall:


- Have a calibration kit, to verify meter calibration prior to each use and on a monthly basis. The calibration checks shall be documented
- Dispatch any instrument not operating properly (or out of calibration) for necessary repair

A monthly inspection shall be performed to include the following:

- Oxygen Meter: Inspect squeeze bulb and hoses for deterioration (where used); Calibrate using appropriate test gas; and Test battery.
- Combustible Gas Meter: Inspect squeeze bulb and hoses for deterioration (where used); Calibrate using appropriate test gas; and Test batteries.
- Toxic Gas Meter: Inspect squeeze bulb and hoses for deterioration (where used); Calibrate using appropriate test gas; and Test batteries.

An external, independent calibration (usually performed by manufacturer) is necessary on a scheduled basis to ensure correct performance of the units. Preventative maintenance shall also be carried out at this time.

This external independent check shall take place on or before the DO NOT USE AFTER (date), which is attached to the instrument. Instruments failing to recharge satisfactorily or calibrate through normal adjustments should be dispatched for repair.

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Instruction manuals and Response Curve Booklet should be kept with each unit. Both publications should be used as a first reference in the event of any questions as to the instrument performance.

5.3 Noise Monitoring

Noise monitoring shall be arranged by the Branch Safety Officer in response to workplace assessments, employee complaints or regulatory requirements. Any initial or baseline monitoring shall consist of personal sampling for the full work shift to determine the 8-hour Time Weighted Average.

Operations that exceed the 8-hour TWA of 85 decibels (dB) shall require implementation of the Hearing Conservation Program covered in Policy No. 34. Operations that exceed the 8-hour TWA of 90 dB will require the use of engineering controls or administrative controls. PPE should be used as a last resort. As a general rule, if at a 3' distance or less, raised voice is required to be heard clearly, noise monitoring is necessary.

All noise sampling and conclusions made resulting from the sampling shall be conducted under the supervision and direction of a Certified Industrial Hygienist. All records and/or reports resulting from noise sampling will be maintained by the Branch Safety Officer indefinitely.


5.4 Temperature Stress (Heat)

ATC personnel are frequently required to perform site operations outdoors and the potential for exposure to temperature extremes is a definite possibility. At hazardous waste sites the effects of adverse temperature exposure can be compounded by the use of required personal protective clothing.

Because of the potential seriousness of this problem, the means to recognize, evaluate, and control this specific hazard must be addressed with each project.

Heat-related problems occur when the body's physiological process fails to maintain a normal body temperature due to excessive heat and/or humidity. A number of physical reactions can occur ranging from fatigue, irritability, anxiety, and decreased dexterity, to nausea, unconsciousness, coma, and death.

ATC management personnel must be able to properly plan for and prevent heat stress disorders. All ATC personnel must be capable of recognizing the onset of heat stress disorders. Refer to specific Appendices for additional guidance.

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5.4.1 Training

Selected personnel should have received training developed by the American Red Cross in first aid and cardiopulmonary resuscitation (CPR), including training in heat-related illnesses. All effected employees shall be trained on the requirements of this program. All workers should be capable of recognizing and treating the signs and symptoms of heat stress conditions. During potential heat stress conditions, ice should be readily available to rapidly cool victims.

5.4.2 Body Fluid Replacement

Water will be made available at project Sites for employee fluid replacement. When heat stress is determined to be a problem by the Project Managers, employees will be provided with balanced, electrolyte solutions to replace fluid and electrolyte loss. Employees will be provided with replacement fluids at a minimum rate of 8 ounces 15 to 20 minutes per person.

5.4.3 Acclimatization

Acclimatization is a gradual physiological adaptation that improves an individual's ability to tolerate heat stress. Full-heat acclimatization requires up to 3 weeks of continued physical activity under heat-stress conditions similar to those anticipate for the work. Its loss begins when the work activity in the heat stress conditions is discontinued. A noticeable loss usually occurs within 3 – 4 days.


5.4.4 Rest Breaks

When heat stress conditions are applicable, all rest breaks should be taken out of the zone of exclusion into a cooler, shaded, rest area. If these conditions are not available, more frequent rest breaks will be taken.

5.4.5 Heat Stress Monitoring

Heat Stress and heat strain are conditions resulting from environmental factors including temperature, relative humidity, radiant heat transfer, and air movement, as they are affected by clothing. The primary objective of the heat stress management program is to prevent heat stroke which is life threatening and the most serious of the heat-induced disabilities. Extra caution should be taken for workers who are not acclimated to working in the heat.

The Heat Stress Index (Appendix 23-03) should be used as a guide to evaluate heat stress situations. If the Heat Stress exceeds 105° F, contact the RSC prior to work for detailed guidance.

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5.5 Temperature Stress (Cold)

Like heat stress, exposure to cold can produce serious effects upon workers at a hazardous waste site. Although it is possible to protect oneself from cold exposure by the use of clothing, some impermeable protective garments trap moisture against the body and increase the likelihood of cold stress.

5.5.1 Types of Cold Stress

Frostbite is the most common form of cold stress. The extremities are most often affected. Signs and symptoms of frostbite include:

- White or grayish-yellow skin
- Pain which subsides to numbness
- Affected part feels very cold

Hypothermia is the lowering of the individual's internal body temperature to a dangerous level. Prompt warming of the body and medical assistance are necessary to prevent serious injury or death. Typical symptoms include:


- Shivering
- Numbness
- Drowsiness
- Muscular weakness, and
- Unconsciousness.

5.5.2 Preventive Measures

A common sense approach is the most effective means of preventing the onset of cold stress. In general, ATC personnel shall use one or more of the following control measures.

- Dress in several layers of thin clothing rather than one thick layer. Several layers of clothing create air pockets which help to insulate.
- Wear inner layers of clothing such as polypropylene or silk long underwear to keep moisture away from the skin.
- Breaks shall be taken in a warm rest area if possible. This may be an office trailer or the cab of a truck.
- If clothing becomes wet, dry replacements shall be donned.
- If personnel become chilled or their extremities become painful or numb, they shall be removed from the cold environment until warm.

5.6 Medical Surveillance Program

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A Medical Surveillance Program is established for ATC field personnel. Refer to Policy No. 42.

5.7 OSHA Toxic & Hazardous Substances Programs

This section contains special programs required for Benzene, Lead, Hydrogen Sulfide (H₂S), Cadmium & Asbestos. These are hazardous substances that could possibly be encountered in the course and scope of some ATC operations. OSHA requires special programs and exposure monitoring for these and other toxic and hazardous substances (see Table 5.7). Refer to OSHA General Industry Standards or the equivalent construction industry standards for applicable programs.

As with all ATC Health and Safety Programs, special programs will be reviewed and updated at least annually or more often reflective of changes in regulations.

Employee training and information for all special programs is outlined in each section and will be provided in a language that the employee understands. Each special program shall be made available for examination and copying upon request of affected employees, their representatives, the Assistant Secretary of Labor and the Director.


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TABLE 5.7
Toxic & Hazardous Substances for Which OSHA Requires Special Programs

Substance	General Industry Standard 29CFR 1910	Substance	General Industry Standard 29CFR 1910
Asbestos	.1001	Lead	.1025
Coal Tar Pitch Volatiles	.1002	Cadmium	.1027
13 Carcinogens	.1003	Benzene	.1028
alpha-Naphthylamine	.1004	Coke oven emission	.1029
Methyl chloromethyl ether	.1006	Bloodborne pathogens	.1030
3,3'-Dichlorobenzidine (and its salts)	.1007	Cotton dust	.1043
bis-Chloromethyl ether	.1008	1,2-dibromo-3-chloro propane	.1044
beta-Naphthylamine	.1009	Acrylonitrile	.1045
Benzidine	.1010	Ethylene oxide	.1047
4-Aminodiphenyl	.1011	Formaldehyde	.1048
Ethyleneimine	.1012	Methylenedianiline	.1050
beta-Propiolactone	.1013	1,3-Butadiene	.1051
2-Acetylamino fluorene	.1014	Methylene Chloride	.1052
4-Dimethylamino-azoBenzene	.1015	Ionizing radiation	.1096
N-nitrosodimethyl- amine	.1016	Hazard Communication	.1200
Vinyl chloride	.1017	Retention of DOT placards & labels	.1201
Inorganic arsenic	.1018	Hazardous chemicals in laboratories	.1450

5.7.1 Benzene

5.7.1.1 Action Level & Permissible Exposure Limit (PEL)

The Action Level for Benzene is an airborne concentration of Benzene of 0.5 ppm calculated as an 8-hour Time-Weighted Average.

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The PEL for Benzene is 8-hour Time Weighted Average exposure of 1 ppm or the short-term exposure limit (STEL) of 5 ppm for 15 minutes.

5.7.1.2 Regulated Areas

Wherever the airborne concentration of Benzene exceeds or can reasonably be expected to exceed the Permissible Exposure Limits, either the 8-hour Time-Weighted Average exposure of 1 ppm or the Short-Term Exposure Limit of 5 ppm for 15 minutes. Access to regulated areas shall be limited to authorized persons.

5.7.1.3 Authorized Persons

An Authorized Person is any person whose duties require them to enter a regulated area, or any person entering such an area for the purpose of observation, monitoring and measuring procedures.


5.7.1.4 Employee Exposure

Generally, ATC employees will not be working in areas where an exposure to Benzene will be at or above the Action Level. However, some Client project sites may involve Benzene, such as petroleum refining operations. As with any potentially hazardous contact, discussions with the Client Site Representative are required, along with an exchange of information and documents related to hazardous materials, such as the Material Safety Data Sheet (MSDS).

Employee exposure will be evaluated and reduced to or below the PEL through the use of engineering, administrative and PPE controls at each specific ATC worksite presenting this exposure and documented on the (Level 3) Environmental Health and Safety Plan (Refer to Policy No. 07, Safety Systems/Health and Safety Plans).

Employee exposure means exposure to airborne Benzene, which would occur if the employee is not using respiratory protective equipment.

- 1) Airborne: The maximum Time-Weighted Average (TWA) exposure limit is 1 part of Benzene vapor per million parts of air (1 ppm) for an 8-hour workday and the maximum Short-Term Exposure Limit (STEL) is 5 ppm for any 15-minute period.

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- 2) Dermal: Eye contact shall be prevented and skin contact with liquid Benzene shall be limited.

If initial or subsequent monitoring identifies a condition above the Action Level of 0.5 ppm averaged over an 8-hour period, employees are directed to immediately don appropriate respiratory protection and PPE and/or that equipment specified on the ATC Health & Safety Plan for the specific worksite.

If continued employee exposure is above the permissible exposure limit for more than 30 days per year, ATC shall attempt reasonable engineering and work practice controls to reduce the exposure, unless not feasible, then continued use of respirators will be permitted. The Project Manager shall document the efforts made to reducing exposure and reasons they were not effective which will be kept with the jobsite file.

5.7.1.5 Health Hazard Data


Benzene can affect health if it is inhaled, or if it comes in contact with skin or eyes. Benzene is also harmful if it is swallowed.

Effects of overexposure include:

- 1) Short-term (acute) overexposure: If overexposed to high concentrations of Benzene occurs, well above the levels where its odor is first recognizable, symptoms of being breathless, irritable, euphoric, or giddy may occur; the employee may experience irritation in eyes, nose, and respiratory tract. The employee may develop headaches; feel dizzy, nauseated, or intoxicated. Severe exposures may lead to convulsions and loss of consciousness.
- 2) Long-term (chronic) exposure. Repeated or prolonged exposure to Benzene, even at relatively low concentrations, may result in various blood disorders, ranging from anemia to leukemia, an irreversible, fatal disease. Many blood disorders associated with Benzene exposure may occur without symptoms.

5.7.1.6 Protective Clothing and Equipment

- 1) Respirators are required for those operations in which engineering controls or work practice controls are not feasible to reduce exposure to the permissible level. The respiratory

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protection program follows 29 CFR 1910.134. When Benzene is present in the workplace less than 30 days a year, respirators may be used in lieu of engineering controls.

- 2) Respirators shall have approved by the National Institute for Occupational Safety and Health (NIOSH), and cartridge or canisters must be replaced before the end of their service life, or the end of the shift, whichever occurs first. If difficult breathing is experienced while wearing a respirator, request a positive pressure respirator.
- 3) Protective Clothing. ATC employees shall wear appropriate protective clothing (such as boots, gloves, sleeves, aprons, etc.) over any body parts that could be exposed to liquid Benzene.
- 4) Eye and Face Protection. Employees shall wear splash-proof safety goggles if it is possible that Benzene may get into eyes. In addition, employees shall wear a face shield if a splash exposure to Benzene liquid is a possibility.

All PPE including respiratory protection will meet the requirements of 29 CFR 1910.133 & 134, and be provided at no cost to affected employees.

5.7.1.7 Emergency and First Aid Procedures

- 1) Eye and face exposure. If Benzene is splashed in the eyes, wash it out immediately with large amounts of water. If irritation persists or vision appears to be affected see a doctor as soon as possible.
- 2) Skin exposure. If Benzene is spilled on clothing or skin, remove the contaminated clothing and wash the exposed skin with large amounts of water and soap immediately. Wash contaminated clothing before it is worn again.
- 3) Breathing. If an employee breathes in large amounts of Benzene, get the exposed person to fresh air at once. Apply artificial respiration if breathing has stopped. Call for medical assistance or a doctor as soon as possible. Never enter any vessel or confined space where the Benzene concentration might be high without proper safety equipment and at least one

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other person present who will stay outside. A lifeline should be used.

- 4) Swallowing. If Benzene has been swallowed and the patient is conscious, do not induce vomiting. Call for medical assistance or a doctor immediately.

5.7.1.8 Medical Surveillance

Medical surveillance shall be made available to affected employees who are or may be exposed to Benzene at or above the Action Level 30 or more days per year or above the PEL 10 or more days per year.

If employee exposures to Benzene exceed 0.5 ppm as an 8-hour Time-Weighted Average, or previously exposed at or above 10 ppm in the past while employed by ATC a medical examination may be requested and provided to the affected workers.

If there is an accidental exposure to Benzene (either by ingestion, inhalation, or skin/eye contact) under emergency conditions known or suspected to constitute toxic exposure to Benzene a medical examination may be requested and provided to the affected workers.


5.7.1.9 Observation of Monitoring

Measurements will be performed that are representative of actual employee exposures to Benzene taken in the breathing zone. Employees or their designated representative are entitled to observe the monitoring procedure including; observe the steps taken in the measurement procedure, and to record the results obtained.

When the monitoring procedure is taking place in an area where respirators or personal protective clothing and equipment are required to be worn all persons must wear the protective clothing and equipment.

5.7.1.9 Access to Records

Employees and their representatives are entitled to see the records of measurements of the exposure to Benzene upon written request. Medical examination records can be furnished to employees, their physicians or designated representatives upon request.

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5.7.1.10 Precautions for Safe Use, Handling and Storage

Benzene liquid is highly flammable. It should be stored in tightly closed containers in a cool, well-ventilated area. Benzene vapor may form explosive mixtures in air. Sources of ignition must be controlled. Use non-sparking tools when opening or closing Benzene containers.

The specific characteristics of Benzene are included on Material Safety Data Sheets (MSDS). Where Benzene exposure is possible, ATC employees must have ready access to the MSDS.

Fire extinguishers, where provided, must be readily available. Know where they are located and how to operate them. Smoking is prohibited in areas where Benzene is used or stored.

5.7.1.11 Employee Information And Training

Information and training will be provided for employees potentially exposed to Benzene including all requirements of this section prior to initial assignment and at least annually thereafter. Training will be documented.


Employees should also be trained on ATC Health and Safety Plan (HASP) requirements along with the Client Site Contingency Plan provisions related to Benzene exposure at the particular worksite. The Site Contingency Plan and HASP must be reviewed, understood, and adhered to by all employees.

5.7.2 Lead

5.7.2.1 Action Level & Permissible Exposure Limit (PEL)

The "Action Level" means employee exposure, without regard to the use of respirators, to an airborne concentration of Lead of 30 micrograms per cubic meter of air ($30 \mu\text{g}/\text{m}^3$) averaged over an 8-hour period.

The standards sets a permissible exposure limit (PEL) of fifty micrograms of Lead per cubic meter of air ($50 \mu\text{g}/\text{m}^3$), averaged over an 8-hour work-day. This is the highest level of Lead in air to which employees may be permissibly exposed over an 8-hour workday. A written plan for work practices controls or engineering controls specific to each work site must be developed when exposures exceed the PEL.

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The 8-hour average it permits short exposures above the PEL so long as for each 8-hour workday the average exposure does not exceed the PEL. When daily exposure to Lead extends beyond a typical 8-hour workday as the result of overtime or other alterations in the work schedule. The standard contains a formula, which reduces the permissible exposure when exposed for more than 8 hours. For example, if an employee is exposed to Lead for 10 hours a day, the maximum permitted average exposure would be $40 \mu\text{g}/\text{m}^3$.

5.7.2.2 Employee Exposure

Generally, ATC employees will not be working in areas where an exposure to Lead will be at or above the Action Level. However, some Client project sites may involve Lead, such as coatings and paints applied to metal surfaces. As with any potentially hazardous contact, discussions with the Client Site Representative are required, along with an exchange of information and documents related to hazardous materials, such as the Material Safety Data Sheet (MSDS).


Employee exposure will be evaluated and reduced to or below the PEL through the use of engineering, administrative and PPE controls at each specific ATC worksite presenting this exposure and documented on the (Level 3) Environmental Health and Safety Plan (Refer to Policy No. 07, Safety Systems/Health and Safety Plans).

5.7.2.3 Exposure Monitoring

If Lead is present in the workplace where employees work in any quantity, air monitoring will be completed to determine whether the Action Level is exceeded for any employee.

If this initial determination shows that a reasonable possibility exists that any employee may be exposed, without regard to respirators, over the Action Level ($30 \mu\text{g}/\text{m}^3$), each location shall set up an air monitoring program to determine the exposure level of every employee exposed to Lead in the workplace.

The goal of the sampling program will enable each employee's exposure level to be reasonably represented by at least one full shift (at least 7 hours) air sample. In addition, these air samples are taken under conditions, which represent each employee's regular, daily exposure to Lead.

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Employees shall be notified in writing of air monitoring results, which represent their exposure. If the results indicate their exposure exceeds the PEL (without regard to use of respirators), then effected employees will be notified of this in writing, and provided with a description of the corrective action that will be taken to reduce exposures.

Exposures must be rechecked by monitoring every six months if the exposure is over the Action Level but below the PEL. Air monitoring must be repeated every 3 months if exposures exceed the PEL. Monitoring will be discontinued if 2 consecutive measurements, taken at least two weeks apart, are below the Action Level. Additional monitoring will be completed whenever there is a production, process, control, or personnel change in the workplace, which may result in new or additional exposure to Lead.

5.7.2.4 Respiratory Protection

Respirators will be required when exposure to Lead is not controlled below the PEL by other means. Employees will also be provided with respirators upon request at no cost to the employee even if employee air exposure levels do not exceed the PEL.


Respirators must meet National Institute for Occupational Safety and Health (NIOSH) requirements under the provisions of 42 CFR Part 84. The respirators selected will provide the proper amount of protection based on airborne Lead exposures.

Employees required to wear a respirator will be provided with proper training in the use cleaning, storage, maintenance and limitations of respirators. Each respirator will be fit tested to ensure that the respirator face piece fits properly.

Employees must check their respirators whenever an increase in breathing resistance is detected and change the filter elements. The respirator face piece should be cleaned regularly to prevent skin irritation.

5.7.2.5 Protective Work Clothing And Equipment

If Lead exposures exceed the PEL, or if exposures include Lead Arsenate or Lead Azide, which can cause skin and eye irritation, protective work clothing and equipment appropriate for the hazard must be worn. This includes gloves, hats, vented goggles, shoes

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or disposable shoe covers at a minimum. All PPE will be provided at no cost to the affected employee. Protective clothing shall be cleaned, laundered, properly disposed and repair or replaced as necessary.

Contaminated work clothing must be removed in change rooms and placed in closed containers in the change room. Contaminated clothing shall not be worn home to prevent exposure to family since Lead from clothing can accumulate in the house, car, etc.

5.7.2.6 Housekeeping

Surfaces must be kept as free as practicable of accumulations of Lead dust. Vacuuming is the preferred method of meeting this requirement, and the use of compressed air to clean floors and other surfaces is absolutely prohibited. Dry or wet sweeping, shoveling, or brushing may not be used except where vacuuming or other equally effective methods have been tried and do not work. Vacuums must be used and emptied in a manner, which minimizes the reentry of Lead into the workplace.

5.7.2.7 Hygiene Facilities And Practices


When the PEL is exceeded, food, beverage, tobacco products and cosmetics shall not be consumed, used or applied within the work area.

Lunchrooms or other eating establishments may not be entered with protective clothing or equipment unless vacuuming, downdraft booth, or other cleaning method has removed surface dust. Preferably, employees should change in the facilities provide and must wash both their hands and faces prior to eating, drinking, smoking or applying cosmetics.

5.7.2.8 Medical Surveillance

Medical surveillance performed by or under the supervision of a licensed physician shall be made available to employees who are exposed in excess of the Action Level for more than 30 days a year.

The initial examination will provide information to establish a baseline to which subsequent data can be compared. An initial medical examination must also be made available (prior to assignment) for each employee being assigned for the first time to

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an area where the airborne concentration of Lead equals or exceeds the Action Level.

Medical examination or consultation shall be made available as soon as possible when employees notify ATC of signs or symptoms commonly associated with Lead poisoning or if an employee has difficulty breathing while wearing a respirator or during a respirator fit test.

Employees shall be provided a medical examination or consultation upon notification that they desire medical advice concerning the effects of current or past exposure to Lead or their ability to procreate a healthy child.

Biological monitoring under the standard consists of blood Lead level (PbB) and zinc protoporphyrin tests at least every 6 months after the initial PbB test. A zinc protoporphyrin (ZPP) test is a very useful blood test, which measures an effect of Lead in the body.


If a worker's PbB exceeds 40 µg/dl the monitoring frequency must be increased from every 6 months to at least every 2 months and not reduced until two consecutive PbBs indicate a blood Lead level below 40 µg/dl. Each time test results indicate that the PbB is determined to be over 40 µg/dl, employees must be notified in writing within five working days of receipt of the test results.

Anytime the PbB exceeds 50 µg/dl a prompt follow-up PbB test will be completed to determine the employee's PbB. If the two tests both exceed 50 µg/dl and the employee is temporarily removed, then successive PbB tests will be completed on a monthly basis during the period of the employee's removal.

5.7.2.9 Medical Removal Protection

Excessive Lead absorption subjects employees to increased risk of disease. Medical removal protection (MRP) is a means of protecting employees when other methods, such as engineering controls, work practices, and respirators, have failed to provide the protection needed. Up to 18 months of protection is provided as a result of removal.

When the physician who is implementing the medical program makes a final written opinion recommending an employee's removal or other special protective measures, the employee may

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be returned only when the physician indicates that it is safe to do so. When employees are medically eligible to return to their former job, they will be returned to their "former job status."

5.7.2.10 Employee Information And Training

Information and training will be provided for employees potentially exposed to Lead including all requirements of this section prior to initial assignment and at least annually thereafter. Training will be documented and include at a minimum:

- The requirements of this special program
- Appendices A & B of 29 CFR 1910.1025
- Specific nature of operations which could result in exposure to Lead above the Action Level and specific engineering and work practice controls put into place to reduce and/or eliminate that exposure
- Respirator selection, fitting, use and limitations
- Purpose and description of the medical surveillance and removal programs
- Dangers of Lead exposure to the reproductive systems

Employees shall also be trained on ATC Health and Safety Plan requirements along with the Client Site Contingency Plan provisions related to Lead exposure at the particular worksite. The Site Contingency Plan and HASP must be reviewed, understood, and adhered to by all employees.

Additional information and training will be provided for employees exposed to Lead above the Action Level or who may suffer skin or eye irritation from Lead.


5.7.2.11 Signs

Warning signs will be posted in areas where the Lead exposure exceeds the PEL. Employees will be informed of the importance of this warning device and be directed not to remove or deface the signs.

5.7.3 H₂S (Hydrogen Sulfide)

5.7.3.1 Action Level & Permissible Exposure Limit (PEL)

The PEL for H₂S is a ceiling concentration of 20 ppm, there is no established Action Level or 8 hour Time Weighted Average exposure limit. A common Industry practice is to follow the

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American Conference of Governmental Industrial Hygienist (ACGIH) has established a Threshold Limit Value (TLV) concentration of 10 ppm for an 8 hour work day.

OSHA will allow an exposure to concentrations of 50 ppm for 10 minutes once during each 8-hour shift as long as no other exposure occurs for the remainder of the day.

5.7.3.2 Characteristics and Health Effects

Hydrogen sulfide (H₂S) is a colorless gas with a powerful nauseating smell of rotten eggs. The odor is a poor warning property because hydrogen sulfide exposure quickly deadens the sense of smell.

The gas is heavier than air and may collect in low areas such as sewers, pits, tunnels or gullies. High airborne levels of hydrogen sulfide (between 4.3 and 46.0 percent of gas by volume in the air) may catch fire if there is a source of ignition. If the gas is burned, toxic products such as sulfur dioxide will be formed.


Hydrogen sulfide is incompatible with oxidizing agents, such as nitric acid and chlorine trifluoride, and may react violently or ignite spontaneously.

Potential employee exposure to H₂S is typically related to drilling operations, recycling drilling mud, water or wastewater from or near sour crude wells, blowouts, work near producing, pipeline and refining operations and work inside tank batteries and/or other wells.

NOTE: Any work performed by ATC Associates employees within confined spaces shall require prior permitting as per the requirements of Policy No. 10, Confined Spaces.

Hydrogen sulfide is extremely toxic. It may cause death instantaneously in high airborne concentrations. Low levels may be extremely irritating to the lungs, nose, throat and eyes.

Hydrogen sulfide can be detected by smell at levels as low as 0.13 parts hydrogen sulfide per million parts air (ppm). Odor cannot be used as a warning because the gas can deaden the sense of smell within 2 to 15 minutes in exposures of approximately 100 ppm.

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Exposures to this gas can interfere with cellular respiration and cause death if an individual's cells are deprived of oxygen.

At low concentrations (i.e., < 10 ppm), hydrogen sulfide causes irritation of the eyes, mucous membranes, and upper respiratory system. When exposed to higher concentrations (10-50 ppm), persons tend to experience mild eye and upper respiratory irritation, headaches, and dizziness. Concentrations from about 50-200 ppm can cause severe eye and respiratory tract irritation, acute conjunctivitis, lacrimation, and difficulty breathing, as well as a sudden loss of consciousness.

Prolonged exposures at these levels may lead to bronchitis, pneumonitis, and migraine headaches. At higher levels, hydrogen sulfide can cause a severe loss of motor coordination, coma, pulmonary edema, respiratory paralysis, and ultimately death.

5.7.3.3 Employee Exposure


Generally, ATC employees will not be working in areas where an exposure to Hydrogen Sulfide will be at or above the Action Level. However, some Client project sites may involve H₂S, such as groundwater monitoring wells, and in particular areas of petroleum refining operations. As with any potentially hazardous contact, discussions with the Client Site Representative are required, along with an exchange of information and documents related to hazardous materials, such as the Material Safety Data Sheet (MSDS).

Employee exposure will be evaluated and reduced to or below the PEL through the use of engineering, administrative and PPE controls at each specific ATC worksite presenting this exposure and documented on the (Level 3) Environmental Health and Safety Plan (Refer to Policy No. 07, Safety Systems/Health and Safety Plans).

Special precautions shall be taken when working inside tanks and vessels including compliance to the permitting requirements of the Confined Space Program.

5.7.3.4 Exposure Monitoring

If H₂S is present or possibly anticipated in the workplace where employees work in any quantity, continuous air monitoring will be

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conducted to determine whether the Action Level is exceeded for any employee. Each personal and area monitor will be preset to alarm at 10 PPM.

Should the alarm sound, employees in the area shall immediately don respirators and institute emergency Health and Safety Plan requirements and vacate the area. Employee shall not re-enter the area without proper respiratory protection.

5.7.3.5 Respiratory Protection

Respirators will be required when exposure to H₂S is not controlled below the PEL by other means. Employees will also be provided with respirators upon request even if employee air exposure levels do not exceed the PEL.

The only type of respirators used to address H₂S exposure shall be a full-face, Self-Contained Breathing Apparatus (SCBA) or airline respirator with an escape SCBA certified by the National Institute for Occupational Safety and Health (NIOSH) requirements.

Employees required to wear a respirator will be provided with proper training in the use cleaning, storage, maintenance and limitations of respirators. Each respirator will be fit tested to ensure that the respirator face piece fits properly. Reference Policy No. 27 for more specific information.

5.7.3.6 Protective Work Clothing And Equipment


If H₂S exposures exceed the PEL, protective work clothing and equipment appropriate for the hazard must be worn. Work clothing must be clean and dry and changed at least weekly or daily if the airborne exposure to H₂S is greater than 10 PPM.

Contaminated work clothing must be removed in change rooms and placed in closed containers in the change room.

5.7.3.7 Medical Surveillance

Medical surveillance must be made available to employees who are exposed in excess of the Action Level for more than 30 days a year.

Medical examination or consultation shall be made available as soon as possible when employees notify ATC of signs or symptoms

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commonly associated with H₂S or if an employee has difficulty breathing while wearing a respirator or during a respirator fit test.

Employees shall be provided a medical examination or consultation upon notification that they desire medical advice concerning the effects of current or past exposure to H₂S.

5.7.3.8 Employee Information And Training

Information and training will be provided for employees potentially exposed to H₂S including all requirements of this section prior to initial assignment and at least annually thereafter. Training will be documented. Employees should also be trained on ATC Health and Safety Plan requirements along with the Client Site Contingency Plan provisions related to H₂S exposure at the particular worksite. The Site Contingency Plan and HASP must be reviewed, understood, and adhered to by all employees.

If no Client Site Contingency Plan provisions are in place, ATC personnel shall evaluate and classify the potential H₂S exposure, be trained in and follow the American Petroleum Institute (API) recommended practices as a minimum including:

No Hazard Condition

Any well that will not penetrate a known Hydrogen Sulfide formation would be categorized as a No Hazard Area. Special Hydrogen Sulfide equipment is not required.

API Condition I - Low Hazard

Work locations where atmospheric concentrations of H₂S are less than 10ppm.

Required for Area:


- Hydrogen Sulfide warning sign with green flag warning device present.
- Keep all safety equipment in adequate working order.
- Store the equipment in accessible locations.

API Condition II - Medium Hazard

Work locations where atmospheric concentrations of H₂S are greater than 10ppm and less than 30ppm.

Required for Area:

- Legible Hydrogen Sulfide warning sign with yellow flag warning

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device present.


- Keep a safe distance from dangerous locations if not working to decrease danger.
- Pay attention to audible and visual alarm systems.
- Follow the guidance of the operator representative.
- Keep all safety equipment in adequate working order.
- Store the equipment in accessible locations.
 - An oxygen resuscitator.
 - A properly calibrated, metered hydrogen sulfide detection instrument.

API Condition III - High Hazard

Work locations where atmospheric concentrations of H₂S are greater than 30ppm.

Required for Area:

- Post legible Hydrogen Sulfide warning sign with red flag warning device.
- Post signs 500 feet from the location on each road Leading to the location, warning of the hydrogen sulfide hazard.
- Check all Hydrogen Sulfide safety equipment to ensure readiness before each tour change.
- Establish a means of communication or instruction for emergency procedures and maintain them on location, along with contact information of persons to be informed in case of emergencies.
- Ensure usability of two exits at each location.
- Do not permit employees on location without hydrogen Sulfide safety training. (Employees may be permitted on location for specific Hydrogen Sulfide training purposes that does not include general rig training.)
- Pay attention to audible and visual alarm systems.
- Store the equipment in accessible locations.
 - Two Hydrogen Sulfide detectors should be present (one should be a properly calibrated, metered detection instrument, and the other should be a pump type with detector tubes. The maximum permissible exposure limit (PEL) is 20 ppm. Respiratory protection would be required if periodic testing indicates employee exposures to H₂S at concentrations above the PEL. See OSHA Standard

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Respiratory Protection, [1910.134]).

- Oxygen resuscitator.
- Three wind socks and streamers.
- Two NIOSH/MSHA 30-minute, self-contained breathing apparatus for emergency escape from the contaminated area only.

5.7.4 Cadmium

5.7.4.1 Action Level & Permissible Exposure Limit (PEL)

The Action Level for workplace exposure to Cadmium is 2.5 micrograms per cubic meter of air ($2.5 \mu\text{g}/\text{m}^3$) calculated as an 8-hour Time-Weighted Average (TWA) exposure.


The PEL is a Time-Weighted Average concentration that must not be exceeded during any 8-hour work shift of a 40-hour work week. The standard sets a PEL of 5 micrograms of Cadmium per cubic meter of air ($5 \mu\text{g}/\text{m}^3$) for all Cadmium compounds, dust, and fumes.

The Separate Engineering Control Airborne Limit (SECAL) is a separate exposure limit to be achieved in specified processes and workplaces where it is not possible to achieve the PEL of $5 \mu\text{g}/\text{m}^3$ through engineering and work practices alone. The SECAL for Cadmium is $15 \mu\text{g}/\text{m}^3$ or $50 \mu\text{g}/\text{m}^3$ depending on the processes involved. The employer covered by the SECAL is required to achieve that limit by engineering and work practice controls to the extent feasible and to protect employees from exposures above the PEL by any combination of compliance methods, including engineering and work practice controls and respirators.

The industries that have separate SECALs identified for specific processes include nickel Cadmium battery production, zinc/Cadmium refining, pigment and stabilizer manufacturing, Lead smelting, and plating.

The SECAL is set at $50 \mu\text{g}/\text{m}^3$ for the following:

- Nickel Cadmium battery industry
Plate making, plate preparation process
- Zinc/Cadmium refining
Cadmium refining, casting melting, oxide production, sinter plant

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- Pigment manufacturing
Calcine, crushing, milling, and blending
- Stabilizer production
Cadmium oxide charging, crushing, drying, and blending
- Lead smelting
Sinter plant, blast furnace, baghouse, and yard area

The SECAL is set at 15 µg/m³ for the following:

- Nickel Cadmium battery industry
All processes not identified above
- Pigment manufacturing
All processes not identified above
- Plating manufacturing
Mechanical plating

Note: 1 ppm = mg/kg

5.7.4.2 Regulated Areas

Wherever the airborne concentration of Cadmium exceeds or can reasonably be expected to exceed the permissible exposure limits of 5 micrograms of Cadmium per cubic meter of air (5 µg/m³) for all Cadmium compounds, dust, and fumes.


Access to regulated areas shall be limited to authorized ATC personnel trained in the requirements of this section.

5.7.4.3 Authorized Persons

An Authorized Person is any person whose duties require them to enter a regulated area for the purpose of observation, monitoring and measuring procedures.

5.7.4.4 Employee Exposure

Although the normal course and scope of ATC operations do not pose a typical employee exposure to Cadmium, some of the worksites where our operations exist do present this potential exposure. Cadmium is an extremely toxic metal commonly found in many industrial workplaces, particularly where any ore is being processed or smelted. Due to its low Permissible Exposure Limit (PEL), overexposures may occur even in situations where trace quantities of Cadmium are found in the parent ore or smelter dust. Cadmium is used extensively in electroplating, although the nature of the operation does not generally lead to overexposures.

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Employees face a greater danger of Cadmium exposure from inhalation than from ingestion. Exposure to Cadmium that may be dangerous to life or health may occur in jobs in which workers are exposed to Cadmium dust or fumes, where they heat compounds or surfaces that contain Cadmium, or where workers weld or cut with materials or solders that contain Cadmium. Several deaths from acute exposure have occurred among welders who have unsuspectingly welded on Cadmium-containing alloys or working with silver solders. Cadmium is also found in industrial paints and may represent a hazard when sprayed.


Operations involving removal of Cadmium paints by scraping or blasting may similarly pose a significant hazard. Cadmium is also present in the manufacture of some types of batteries. Cadmium emits a characteristic brown fume (CdO) upon heating, which is relatively non-irritating, and thus does not alarm the exposed individual.

Suitable precautions shall be taken by ATC employees engaged in maintenance of ventilation systems and changing of filters including use of Protective Clothing and Equipment defined further in section 5.7.4.6 of this Policy.

5.7.4.5 Health Hazard Data

The primary and most serious adverse health effects of long-term exposure to Cadmium include kidney dysfunction, lung cancer, and prostate cancer. Effects of overexposure include:

- Short-term (acute) overexposure: Metal fume fever may result from acute exposure with flu-like symptoms of weakness, fever, headache, chills, sweating and muscular pain. Acute pulmonary edema usually develops within 24 hours and reaches a maximum by three days. If death from asphyxia does not occur, symptoms may resolve within a week.
- Long-term (chronic) exposure: The most serious consequence of chronic Cadmium poisoning is cancer (lung and prostate). The first observed chronic effect is generally kidney damage, manifested by excretion of excessive (low molecular weight) protein in the urine. Cadmium also is believed to cause pulmonary emphysema and bone disease (osteomalacia and osteoporosis). The latter has been observed in Japan ("itai-itai" disease) where residents were exposed to Cadmium in rice crops irrigated with Cadmium-contaminated water. Cadmium

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may also cause anemia, teeth discoloration (Cd forms CdS) and loss of smell (anosmia).


5.7.4.6 Protective Clothing and Equipment

Primary control shall focus on inhalation. Inhaled Cadmium is more readily absorbed into the body than is ingested Cadmium. Intake of Cadmium by ingestion and skin absorption are considered to be of relatively less importance in occupational settings.

- Respirators are required for those operations in which engineering controls or work practice controls are not feasible to reduce exposure to the permissible level. The respiratory protection program is detailed in section 27 and follows CFR 29 1910.134. When Cadmium is present in the workplace less than 30 days a year, respirators may be used in lieu of engineering controls.
- Respirators shall have National Institute for Occupational Safety and Health (NIOSH) seal of approval, and cartridge or canisters must be replaced before the end of their service life, or the end of the shift, whichever occurs first. If difficult breathing is experienced while wearing a respirator, request a positive pressure respirator.
- Protective Clothing: ATC employees shall wear appropriate protective clothing (such as coveralls, head coverings, boots, gloves, sleeves, aprons, etc.) over any body parts that could be exposed to Cadmium.
- Eye and Face Protection: Employees shall wear splash-proof safety goggles if it is possible that Cadmium may get into eyes. In addition, employees shall wear a face shield if exposure to Cadmium is a possibility.

Additionally, ATC shall incorporate the following precautions to protect workers:

- Employees must remove all protective work clothing and equipment at the end of a shift in a changing area designated for this purpose, taking care not to shake or blow any Cadmium residue from the clothing or equipment.

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- Changing rooms must have separate storage areas for street clothes and for Cadmium-contaminated protective clothing.
- Clean and maintain protective work clothing and equipment, which includes washing at least once a week and repairing or replacing as necessary; tears or rips in protective clothing must be repaired immediately or the item replaced.
- Employees exposed to Cadmium above the PEL must shower at the end of a work shift when exposure occurred and may not eat, drink, smoke, chew tobacco or gum, or apply cosmetics before washing their hands and face.


Cleaning or laundering Cadmium-contaminated work clothing requires special precautions. The project manager shall ensure that any person designated to handle protective clothing and equipment contaminated with Cadmium understands the potential harmful effects of exposure and knows how to launder or clean such items in a safe manner that prevents the release of Cadmium at levels above the PEL.

An important step in this process is to ensure that only authorized employees remove Cadmium-contaminated clothing or equipment from the workplace for any purpose, including laundering, cleaning, or disposal. Items removed from the work area for cleaning, maintenance, or disposal must be placed in sealed, impermeable bags designed to prevent dispersion of Cadmium dust. These bags must be labeled as described in the section on communicating hazards to employees.

5.7.4.7 Emergency and First Aid Procedures

The written emergency plan shall be documented on the (Level 3) Health and Safety Plan (Refer to Policy No. 07, Safety Systems/Health and Safety Plans). The HASP shall define specific respirator and PPE requirements determined to be appropriate to the site.

In the case of an emergency that may result in acute Cadmium exposure for an employee, ATC shall immediately provide a medical examination equivalent to the standard periodic medical exam as soon as possible, with special emphasis on the respiratory system, and other organ systems considered appropriate by the

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examining physician, and monitoring for symptoms of overexposure.

Acute poisoning

By inhalation: The employee should be removed from exposure as soon as possible. Because the onset of symptoms is delayed the employee should receive medical attention as soon as possible.

Monitor respiratory function: chest x-ray and blood gases.

By ingestion: If the employee has not already vomited, induce vomiting with syrup of ipecac or perform gastric lavage.

Local effects from skin exposure: Wash skin immediately with copious amounts of water for at least 15 minutes. Remove contaminated clothing. Wash eyes with copious amounts of water for at least 15 minutes.

The treatment of respiratory or cardiovascular disturbances is supportive.


Chronic poisoning: Treatment is supportive. Seek medical attention.

5.7.4.8 Medical Requirements

If employee exposure to airborne Cadmium (Cd) exceeds the Action Level (AL) of 2.5 micrograms per cubic meter of air (2.5 µg/m³) for 30 or more days per year (or in a 12-month consecutive period), this creates a need for airborne exposure monitoring, a medical surveillance program for employees who are at or above the AL on 30 or more days per year, and the provision of a respirator to any employee that requests one.

If Cd in urine exceeds 3 µg/g creatinine, or if Beta-2 microglobulin (indicating excessive protein excretion) exceeds 300 µg/g creatinine, or if Cd in whole blood exceeds 5 µg/liter, a reassessment of the employee's exposure and follow up medical surveillance is required.

All medical examinations related to this requirement shall be provided at no cost to the employee at a reasonable time and convenient place, and they shall be performed by or under the

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supervision of a licensed physician who is familiar with the regulatory text of the Cadmium standard, including appendices that provide details on health effects and protocols for sample handling and laboratory selection. Biological samples must be collected in a manner that assures their reliability, and analyses must be performed in laboratories with demonstrated proficiency in the testing performed.

ATC shall promptly inform the employee of the option to seek a second medical opinion after any medical examination or consultation provided by a physician provided by the employer to review any findings, determinations, or recommendations or to conduct examinations, consultations, or laboratory tests. The employee is required to notify ATC that he/she intends to seek a second medical opinion and to initiate steps to make an appointment within 15 days of being told of this option or of receiving the physician's written opinion from an ATC provided examination, whichever is later, as a condition of providing payment for a second medical opinion.

Medical surveillance begins with an initial examination for each employee covered by this requirement within 30 days of employment in a position that involves exposure to Cadmium. The only exception is for employees who can show that they have had an examination that includes all required elements in the last 12 months. Results from a qualifying examination within the last 12 months must be maintained as part of the employee's medical record and are treated as the initial examination.

ATC shall provide the examining physician with a copy of the OSHA Cadmium standard and all appendices, a description of each affected employee's former, current, and anticipated duties and exposure levels as they relate to the employee's occupational exposure to Cadmium, results of any previous medical and biological monitoring, and a description of personal protective equipment used by each employee.

ATC shall obtain from the examining physician a written medical opinion for each medical examination performed on each employee. The physician must be told not to reveal any findings or diagnoses unrelated to occupational exposure to Cadmium to the employer.

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In the case of an emergency that may result in acute Cadmium exposure for an employee, ATC shall provide a medical examination equivalent to the standard periodic medical exam as soon as possible, with special emphasis on the respiratory system, and other organ systems considered appropriate by the examining physician, and monitoring for symptoms of overexposure.

5.7.4.9 Observation of Monitoring

Measurements will be performed that are representative of actual employee exposures to Cadmium. Employees or their designated representative are entitled to observe the monitoring procedure including; observe the steps taken in the measurement procedure, and to record the results obtained. When the monitoring procedure is taking place in an area where respirators or personal protective clothing and equipment are required to be worn all persons must wear the protective clothing and equipment.

5.7.4.10 Access to Records

Employees and their representatives are entitled to see the records of measurements of the exposure to Cadmium upon written request. Medical examination records can be furnished to employees, their physicians or designated representatives upon request.

5.7.4.11 Employee Information And Training


Information and training will be provided for all ATC employees potentially exposed to Cadmium including all requirements of this section prior to initial assignment and at least annually thereafter. Training will be documented including the identity of all employees trained, signature of the person providing the training and date of the training. Training records must be kept for a minimum of one year.

Employees should also be trained on ATC Health and Safety Plan requirements along with the Client Site Contingency Plan provisions related to Cadmium exposure at the particular worksite. The Site Contingency Plan and HASP must be reviewed, understood, and adhered to by all employees.

5.7.5 Asbestos

5.7.5.1 Action Level & Permissible Exposure Limit (PEL)

The standards set a permissible exposure limit (PEL) of 0.1 fibers of Asbestos per cubic centimeter of air (0.1 f/cc), averaged over an

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8-hour workday. The standards also set a thirty-minute excursion limit (EL) of 1.0 f/cc. When either of these limits is exceeded, ATC will review and re-emphasize engineering, work practice and respiratory protection control measures to reduce employee exposure. When the limit is exceeded as a result of work regulated under OSHA's General Industry Standard (i.e., non-construction work) the exposure reduction measures will be documented in a written work plan.

Engineering and work practice controls may include exhaust and filtration systems, wetting methods, cleaning and other specialized procedures to minimize dust exposure. Additionally, areas in which exposure limits are exceeded will be designated as regulated areas, and access to such areas shall be limited to persons appropriately trained and equipped.


5.7.5.2 Regulated Areas

This subsection applies to ATC employees engaged in Asbestos-related activities. Employee activities are expected to fall under either the General Industry (29 CFR 1910.1001) or Construction Asbestos Standards (29 CFR 1926.1101). In addition to federal regulations, employee activities may be regulated at the state and local level. Access to areas in excess of the PEL of 0.1 f/cc, averaged over an 8-hour workday or a thirty-minute Excursion Limit (EL) of 1.0 f/cc is restricted to authorized personnel only.

5.7.5.3 Employee Exposure

Generally, ATC employees will not be working in areas where an exposure to Asbestos will be at or above the Action Level. However, some Client project sites may involve Asbestos, such as insulation, fire-retardant spray-on coatings, heat-resistant insulation on process or other equipment, ceiling and/or floor tiles, and similar applications. As with any potentially hazardous contact, discussions with the Client Site Representative are required, along with an exchange of information and documents related to hazardous materials, such as the Material Safety Data Sheet (MSDS).

Employee exposure will be evaluated and reduced to or below the PEL through the use of engineering, administrative and PPE controls at each specific ATC worksite presenting this exposure and documented on the (Level 3) Environmental Health and Safety

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Plan (Refer to Policy No. 07, Safety Systems/Health and Safety Plans).

5.7.5.4 Exposure Monitoring

If Asbestos fibers are present, or are reasonably anticipated to be present at or above established exposure limits (PEL or EL), personal air monitoring will be conducted to determine if exposure limits have been exceeded.

The goal of the sampling program is to obtain a representative measurement of employee exposure, typically by collecting a full shift air sample (representative of an 8 hour TWA) and one 30-minute excursion limit sample from the breathing zone. These samples are to be taken under conditions that represent regular, daily exposure to Asbestos.

Employees will be notified in writing of air monitoring results representative of their exposure. If the results indicate exposure in excess of an established exposure limit, affected employees will be notified in writing, and provided with a description of the corrective action that will be taken to reduce exposures.


If the exposure is anticipated to be above the 8-hour TWA or 30-minute excursion limit PELs, exposures should be rechecked every six months. Additional monitoring should be conducted whenever there is a production or process, control change in the workplace that may result in new or additional exposure to Asbestos.

5.7.5.5 Respiratory Protection

Respirators will be required during emergencies and when exposure to Asbestos cannot be controlled to below the PELs by other means. Respirators will be provided at no cost to employees.

Employees engaged in construction-related Asbestos activities will be required to wear, at minimum, half-face air-purifying respirators equipped with high-efficiency filters during:

- Class I Asbestos activities where a Negative Exposure Assessment (NEA) has been made, and
- Class II and III activities where a NEA has not been made.

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Employees are required to wear tight-fitting, powered air-purifying respirators (PAPR) during Class I Asbestos activities if a NEA has not been made.

Upon request, employees will be provided with respirators even if air exposure levels do not exceed the PEL. Also upon request, employees will receive a PAPR even if a NEA has been established for the required activities.

Respirators must meet National Institute for Occupational Safety and Health (NIOSH) requirements under the provisions of 42 CFR part 84. The respirators selected will provide the proper amount of protection based on airborne Asbestos exposures.


In accordance with ATC's Respiratory Protection Program, employees required to wear a respirator will be provided with proper training in the use cleaning, storage, maintenance and limitations of respirators. Each respirator will be fit tested in accordance with requirements of 29 CFR 1910.1001 or 29 CFR 1926.1101 to ensure that the respirator face piece fits properly. The Branch Safety Officer or project safety officer will repeat fit tests at least annually.

Employees must check their respirators whenever an increase in breathing resistance is detected and change the filter elements. The respirator face piece should be cleaned regularly to prevent skin irritation. Also reference Policy No. 27, Respiratory Protection.

5.7.5.6 Protective Work Clothing And Equipment

If Asbestos exposures exceed the PEL, or if work is conducted within Class I work areas or other regulated areas where a NEA has not been produced, protective work clothing and equipment appropriate for the hazard must be worn including coveralls, foot coverings, face shield and vented goggles along with appropriate respiratory protection.

Appropriate respiratory protection, disposable full body, head and foot coverings and gloves must be donned prior to entering the regulated area and doffed following the required decontamination sequence for the activity. When half-face respirators are worn, protective eyewear or ventilated goggles must be worn.

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Contaminated work clothing must be removed in change rooms and placed in the proper containers in the change room. Employees must use available showers and decontamination facilities when required (i.e. Class I gross removal regulated area).

Employees will receive training in the proper use and limitations of PPE. Additional PPE requirements are detailed in Policy No. 25, Personal Protective Equipment.

5.7.5.7 Housekeeping

Surfaces must be kept as free as practicable of accumulations of Asbestos dust. High Efficiency Vacuuming and wet methods are the preferred methods of meeting this requirement, and the use of compressed air to clean floors and other surfaces is absolutely prohibited. Dry sweeping, shoveling, or brushing may not be used. Vacuums must be used and emptied in a manner, which minimizes the reentry of Asbestos into the workplace.


Employees that perform housekeeping duties in regulated areas are included in Asbestos safety programs, as required by applicable OSHA regulations.

5.7.5.8 Hygiene Facilities And Practices

When the PEL is exceeded, food, beverage, tobacco products and cosmetics shall not be consumed, used or applied within the work area. Lunchrooms or other eating establishments may not be entered with protective clothing or equipment unless vacuuming, downdraft booth, or other cleaning method has removed surface dust. These areas must also be maintained below the PELs. Preferably, employees should change in the facilities provided and must wash both their hands and faces prior to eating, drinking, smoking or applying cosmetics.

5.7.5.9 Medical Surveillance

Medical surveillance must be made available to employees who are exposed in excess of the PEL for more than 30 days a year, however all employees who conduct Asbestos related activities are included in ATC's Medical Surveillance Program for Asbestos. Employees shall also participate in the Respiratory Protection Program and receive annual respirator clearance for each type respirator used.

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Medical examinations beyond the initial exam shall be made available on an annual basis. The initial examination will provide information to establish a baseline to which subsequent data can be compared. An initial medical examination must also be made available (prior to assignment) for each employee being assigned for the first time to an Asbestos related occupation or work area.

Medical examination or consultation shall be made available as soon as possible when employees notify ATC of a potential uncontrolled Asbestos exposure or if an employee has difficulty breathing while wearing a respirator or during a respirator fit test.

5.7.5.10 Medical Removal Protection

When the physician who is implementing the medical program makes a final written opinion recommending an employee's removal or other special protective measures, the employee may be returned only when the physician indicates that it is safe to do so. When employees are medically eligible to return to their former job, they will be returned to their "former job status."


5.7.5.11 Employee Information And Training

Prior to initial job assignment that may expose an employee to Asbestos, and annually thereafter, Asbestos information and training will be provided for employees. Training will be documented with a certificate of completion and, at minimum, will meet the two-hour general awareness requirements.

Employees should also be trained on ATC Health and Safety Plan requirements along with the Client Site Contingency Plan provisions related to Asbestos exposure at the particular worksite. Reference Policy No. 07, Safety Systems/Health and Safety Plans. The Site Contingency Plan and HASP must be read, understood, and adhered to by all employees.

Employees who conduct Asbestos surveys, project monitoring and similar duties will receive additional training. Such training will be provided in accordance with EPA's Model Accreditation Plan (40 CFR 763) and as required by OSHA regulations.

Training will be provided in a language that the employees understand and will include information regarding the health effects of Asbestos, including various types of cancer and synergistic effects between Asbestos exposure and lung cancer.

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5.7.5.12 Regulated Work Areas and Signage

Danger signs will be posted in areas where the Asbestos exposures exceed the PEL or where construction activities require the establishment of regulated areas. Signage and danger labels for Asbestos waste will comply with OSHA requirements and be presented in a language that employees understand.

6.0 Appendices

23-01 – Action Level Guidelines


23-02 – Hot Weather Symptoms & Precautions

23-03 – Heat Stress Index

23-04 – Heat Stress Control Checklist

7.0 References


- Occupational Safety and Health Administration (OSHA), 29 CFR Part 1910 Subpart(s) G, J, Z
- Occupational Safety and Health Administration (OSHA), 29 CFR Part 1926.51(c) Table D-1 & Subpart(s) C, D, Z
- Occupational Safety and Health Administration (OSHA), 29 CFR Part 1910.1200
- Occupational Safety and Health Administration (OSHA), 29 CFR Part 1910.1028 & 1926.1128 - Benzene
- Occupational Safety and Health Administration (OSHA), 29 CFR Part 1910.1025 & 1926.62 - Lead
- Occupational Safety and Health Administration (OSHA), 29 CFR Part 1910.1027 & 1926.1127 - Cadmium
- Occupational Safety and Health Administration (OSHA), 29 CFR Part 1910.1001 & 1926.1101 - Asbestos

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ACTION LEVEL GUIDELINES

<u>Monitoring Device</u>	<u>Hazard Action Level</u>	<u>Action</u>
Combustible Gas Indicator	Explosion and/or Fire	<5% LEL · Continue investigation with caution
		5% - 10% LEL · Continue on-site monitoring with extreme caution
		>10% LEL · Explosion hazard; withdraw from area immediately
Oxygen Meter	Oxygen deficiency	<19.5% · Immediately withdraw from area unless equipped with SCBA or airline system (with 5 minute escape bottle)
		19.5% - 23.5% · Stop work. Evaluate cause of low oxygen and find a solution. Implement solution and proceed with caution; monitor for presence of toxic or combustible gases and vapors
	Oxygen enrichment	>23.5% · Immediately withdraw from area; fire hazard potential
Radiation Survey Meter	Ionizing Radiation	<0.2 mR/hr · Proceed with caution; if radiation is detected above background levels, this signifies the presence of possible radiation sources (consult health physicist)
		>0.2 mR/hr · Potential radiation hazard; evacuate site and consult health physicist
Photoionization ¹ Detector (PID) Flame Ionization Detector (FID)	Toxic Organic Vapor/Gases	Depends on substance. Recommend no more than 50% of PEL or TLV · Determine cause of exposure; provide control to extent practical; upgrade to high level of personal protection

¹ Consult reference source for ionization potential (IP) for each substance being monitored

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Sunburn			
Cause	Symptoms	First-Aid	Prevention
<ul style="list-style-type: none"> Exposure of skin to direct sun Can occur on overcast days 	<ul style="list-style-type: none"> Red, hot skin May blister Moderate to severe pain Can result in fever 	<ul style="list-style-type: none"> Move to shade; loosen clothing if necessary Apply cold compress or immerse in cool water Apply moisturizing lotion to affected areas Hydrate with fluids Do NOT break blisters Call COMP-CARE for assistance 	<ul style="list-style-type: none"> Adequate sun protection Use sunscreen liberally and apply often, especially when sweating excessively Select SPF 15 or higher Wear proper clothing, cap (hard hat)
Heat Rash (Prickly Heat)			
Cause	Symptoms	First-Aid	Prevention
<ul style="list-style-type: none"> Restrictive clothing Excessive sweating Inadequate hygiene Causes heat intolerance if 20% of skin affected 	<ul style="list-style-type: none"> Red, itchy skin Bumpy skin due to blocked pores Moderate to severe itching Can result in infection 	<ul style="list-style-type: none"> Apply cold compress or immerse in cool water Keep area affected dry Call COMP-CARE for assistance 	<ul style="list-style-type: none"> Wear proper clothing Shower after excessive sweating
Heat Cramps			
Cause	Symptoms	First-Aid	Prevention
<ul style="list-style-type: none"> Excessive loss of electrolytes from body due to excessive sweating Not acclimatized to hot weather 	<ul style="list-style-type: none"> Painful skeletal muscle cramps or spasms Mostly affects legs and arms 	<ul style="list-style-type: none"> When eating meals, replace salts lost by sweating Sit quietly in the shade or cool area Massage affected muscle Ensure proper hydration (see Note #2) Call COMP-CARE for assistance 	<ul style="list-style-type: none"> Eat meals to replace salt Consume electrolyte supplemented beverages if adequate meals have not been consumed prior to prolonged periods of heavy sweating Ensure adequate heat acclimatization
Heat Exhaustion			
Cause	Symptoms	First-Aid	Prevention
<ul style="list-style-type: none"> Body fatigue and strain on heart due to overwhelming heat stress Dehydration (see below) Inadequate acclimatization Inadequate physical fitness for work task Most common exertional heat illness 	<ul style="list-style-type: none"> Dizziness Fatigue Weakness Headache, nausea Unsteady walk Rapid pulse Shortness of breath 	<ul style="list-style-type: none"> Initiate active cooling by best means available Move to shade and loosen clothing Lay flat and elevate feet Spray/pour water on employee and fan for cooling effect or use ice sheets around neck, arm pits, and groin, if available Monitor employee closely Assess employee's mental status every few minutes Follow hydration guidelines Call COMP-CARE for assistance 	<ul style="list-style-type: none"> Allow for acclimatization Monitor WBGT/Heat Stress Index Keep employee in shade whenever possible Follow hydration guidelines Observe work/rest cycles Identify high-risk individuals Maintain buddy system Do not take dietary supplements Modify clothing as needed Teach early recognition of symptoms Recognize cumulative effect of sequential hot days Reevaluate tasks if mild heat injuries occur

NOTES:

[1] Source material – Department of the Army, Office of the Surgeon General, Falls Church, VA (April 8, 2005).

[2] Hydration Guide: Drink 1 cup (~8 ounces) cool water each 15 to 20 minutes; alternate with sports drink (electrolyte replacement) such as Gatorade.

[3] Clothing – If possible, wear light-colored, breathable clothing. If employees are required to use non-permeable clothing (e.g., Tyvek), consult with Regional Safety Coordinator (RSC) prior to project.

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Heat Stroke			
Cause	Symptoms	First-Aid	Prevention
<ul style="list-style-type: none"> Prolonged exposure to high temperatures Cumulative heat stress due to repetitive activity in hot environment Failure of body's cooling mechanisms Prolonged and overwhelming heat stress Predisposing factors such as sickness, poor health, or certain medications 	<ul style="list-style-type: none"> Red, hot, and dry skin (no sweating) Any of above symptoms, but more severe Nausea, vomiting Altered mental status with agitation, confusion, delirium, disorientation Elevated temperature, usually above 104° F Can progress to loss of consciousness, coma, and seizures 	<ul style="list-style-type: none"> This is a MEDICAL EMERGENCY and can lead to DEATH! Call 911 and get employee to medical facility immediately Begin cooling aggressively. Body temperature that does not go below 100° F with active cooling or ANY mental status changes calls for immediate action. Initiate measures for heat exhaustion Apply ice packs or iced sheets Assess employee's mental status every few minutes If conscious, give sips of cool water while waiting for ambulance Do <u>NOT</u> give water to unconscious employee If possible, measure body temperature Continue cooling process during transport 	<ul style="list-style-type: none"> Follow measures for heat exhaustion Plan medical support for heat intensive operations Ensure appropriate medical procedures are available (contact numbers for COMP-CARE and local emergency facilities)


Additional Medical Considerations in Hot Environment			
Dehydration			
Cause	Symptoms	First-Aid	Prevention
<ul style="list-style-type: none"> Depletion of body fluids and possibly salt 	<ul style="list-style-type: none"> Dizziness Weakness and fatigue Rapid pulse Lower urine output, darker than normal urine color 	<ul style="list-style-type: none"> Replace lost water and electrolytes Water should be sipped, not gulped Call COMP-CARE for assistance 	<ul style="list-style-type: none"> Hydrate per guidelines Consume full meals and drink at meal time Do not take dietary supplements
Over Hydration (Hyponatremia)			
Cause	Symptoms	First-Aid	Prevention
<ul style="list-style-type: none"> Over hydration or water intoxication Decreased meals or dieting Loss of body salt Misdiagnosis and treatment for hydration 	<ul style="list-style-type: none"> Confusion Weakness Nausea, vomiting 	<ul style="list-style-type: none"> Replace salt loss Follow measures for heat exhaustion Call COMP-CARE for assistance If symptoms persist or become more severe with rehydration, immediately call 911 	<ul style="list-style-type: none"> Hydrate per guidelines Consume full meals and drink at meal time Do not take dietary supplements

NOTES:

[1] Source material – Department of the Army, Office of the Surgeon General, Falls Church, VA (April 8, 2005).

[2] Hydration Guide: Drink 1 cup (~8 ounces) cool water each 15 to 20 minutes; alternate with sports drink (electrolyte replacement) such as Gatorade.


[3] Clothing – If possible, wear light-colored, breathable clothing. If employees are required to use non-permeable clothing (e.g., Tyvek), consult with Regional Safety Coordinator (RSC) prior to project.

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Heat Stress Index									
Temp. °F	Relative Humidity								
	10%	20%	30%	40%	50%	60%	70%	80%	90%
105	98	104	110	120	132				
102	97	101	108	117	125				
100	95	99	105	110	120	132			
98	93	97	101	106	110	125			
96	91	95	98	104	108	120	128		
94	89	93	95	100	105	111	122		
92	87	90	92	96	100	106	114	122	
90	85	88	90	92	96	100	106	114	122
88	82	86	87	89	93	95	100	106	115
86	80	84	85	87	90	92	96	100	109
84	78	81	83	85	86	89	91	95	99
82	77	79	80	81	84	86	89	91	95
80	75	77	78	79	81	83	85	86	89
78	72	75	77	78	79	80	81	83	85
76	70	72	75	76	77	77	77	78	79
74	68	70	73	74	75	75	75	76	77

NOTES: Add 10° F when protective clothing is being used; Add 10° F when in direct sunlight

HSI Temp	Category	Injury Threat
Above 130° F	Extreme Danger	Heat cramps or exhaustion likely, heat stroke possible if exposure is prolonged and there is physical activity.
105° to 130° F	Danger	Heat cramps or exhaustion likely, heat stroke possible if exposure is prolonged and there is physical activity.
90° to 105° F	Extreme Caution	Heat cramps or exhaustion likely, heat stroke possible if exposure is prolonged and there is physical activity.
80° to 90° F	Caution	Heat cramps or exhaustion likely, heat stroke possible if exposure is prolonged and there is physical activity.
Below 80° F	Normal Range	Typical conditions for time of year. Little or no danger under normal circumstances.

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HSI Temp	Category	Precautions
Above 130° F	Extreme Danger	No work unless emergency exists. Contact ATC RSC and Corporate Risk Management Department prior to proceeding.
105° to 130° F	Danger	Contact RSC prior to proceeding. Requires strict adherence to ACGIH Heat Stress Guidelines, including use of on-site WBGT equipment.
90° to 105° F	Extreme Caution	Refer to Controls.
80° to 90° F	Caution	Refer to Controls.
Below 80° F	Normal Range	Typical conditions for time of year. Little or no danger under normal circumstances. As always, anticipate problems and work safely.

Heat Stress Controls

Controls for Extreme Danger Conditions (Heat Stress Index Above 130° F)	
	No work unless emergency exists. Contact Regional Safety Coordinator prior to work for detailed guidance based on ACGIH

Controls for Danger Conditions (Heat Stress Index 105° F to 130° F)	
	<p>Contact Regional Safety Coordinator prior to work for detailed guidance based on ACGIH.</p> <p>Work plan must be reviewed & pre-approved by RSC.</p> <p>Mandatory use of Appendix 23-05 (Personal Heat Strain Prevention Plan).</p>


Controls for Extreme Caution Conditions (Heat Stress Index 90° F to 105° F)	
	<p>(1) Engineering Controls (Recommended): Use misting stations, canopy shade for breaks.</p> <p>(2) Administrative Controls: Employee training; frequent symptom observations (by Site Safety Officer; Work variations (alternate heavy/light).</p> <p>Hydration: Drink approximately 16 ounces of fluid before work. Drink approximately 1 cup (~8 oz) of fluid (cool water) every 15 to 20 minutes. Alternate with electrolyte replacement drinks such as Gatorade. Limit sugared and caffeinated drinks.</p> <p>Work/Rest Cycles: Work 1 hour, then take 15 minute break in shaded area. Stop work at approximately 3:00 pm to evaluate all personnel and determine if work can continue Until end of shift</p> <p>Other: Recommend use of Appendix 23-05 (Personal Heat Strain Prevention Plan).</p>

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Controls for Caution Conditions (Heat Stress Index 80° F to 90° F)	
	<p>(1) Engineering Controls (Recommended): Use misting stations, canopy shade for breaks.</p> <p>(2) Administrative Controls: Employee training; frequent symptom observations (by Site Safety Officer; Work variations (alternate heavy/light).</p> <p><u>Hydration</u>: Drink approximately 16 ounces of fluid before work. Drink approximately 1 cup (~8 oz) of fluid (cool water) every 15 to 20 minutes. Alternate with electrolyte replacement drinks such as Gatorade. Limit sugared and caffeinated drinks.</p> <p><u>Work/Rest Cycles</u>: Work 1 hour, then take 15 minute break in shaded area. Stop work at approximately 3:00 pm to evaluate all personnel and determine if work can continue until end of shift.</p> <p><u>Other</u>: Recommend use of Appendix 23-05 (Personal Heat Strain Prevention Plan).</p>

Footnotes:

- [1] Contact your Supervisor with any questions or concerns.
- [2] Contact your Regional Safety Coordinator (RSC) at any time to discuss safety issues.
- [3] Based on Wildland Fire Safety Guides & American Conference of Governmental Industrial Hygienists (ACGIH) guidelines.

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Branch & Project Site Location: _____

Project Number: _____

Project Manager: _____

Date: _____

This checklist is intended as a guide for use by Project Managers (and others) in the prevention of heat strain among workers. It is based on the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value (TLV) for Heat Stress and Strain. The checklist is most effective when used in conjunction with Time Weighted Average measurements or estimates of heat stress as described in the TLV. However, the control and monitoring strategies described here are useful for reducing the risk of heat strain, even in the absence of exposure data. In other words, if common sense tells you that heat stress is a risk factor, you should select from the various strategies described here to reduce the risk.

YES NO N/A

GENERAL CONTROLS

- | | | | |
|--------------------------|--------------------------|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Provide accurate verbal and written instructions; frequent training and awareness programs and other information about heat stress and strain. Advise employees to wear light colored, loose fitting clothing (but not so loose it can become entangled in moving equipment). |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Encourage drinking cool water to hydrate 1 –2 hours before starting work and about 1 cup (8 oz.) of cool water every 20 minutes during hot work. It is important to maintain this rate of hydration during hot work, even if not thirsty. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Promote self-limitation of exposures (including regular breaks in shady or cool areas) and encourage co-workers to observe each other to detect signs and symptoms of heat strain. Report findings to your supervisor immediately. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Advise and monitor those who may be at higher risk due to medications, personal or lifestyle factors to ensure they conform closely to these General Controls. Personnel at higher risk include those who take medications that may compromise normal cardiovascular, blood pressure, body temperature regulation, renal, or sweat gland functions; those who abuse or are recovering from the abuse of alcohol or other intoxicants; those who are overweight or dieting; those who have reduced blood volume (due to recent blood donation or menstruation), those who are dehydrated for any reason, and those who, due to any other factors, are not feeling well. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Encourage healthy lifestyles, ideal body weight and electrolyte balance. (Note: most people get enough electrolytes from their regular diet and electrolyte replacement drinks are not necessary, but in most cases is not harmful. Those who take medications should consult their personal physician to ensure no added risk from electrolyte drinks. Do not take salt tablets. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Adjust expectations of those returning to work after absence from hot exposure situations (because they will have lost their "acclimatization" to the heat). Encourage consumption of salty foods (unless the person is on a salt restricted diet or the employee says it would conflict with guidance from the employee's personal physician). |

BASIC PHYSIOLOGICAL OBSERVATIONS AND INDICATORS OF HEAT STRAIN


- | | | | |
|--------------------------|--------------------------|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Watch for symptoms of sudden and severe fatigue, nausea, dizziness or lightheadedness; or |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Profuse sweating that is sustained over several hours; or weight loss over a shift that is greater than 1.5% of body weight; or |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Sustained (several minutes) heart rate is in excess of 180 bpm (beats per minute) minus the individual's age in years (180 – age), for individuals with normal heart function. Take pulse at wrist for 30 seconds, then multiply x 2 to get total bpm. or; |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Recovery heart rate at one minute after a peak work effort is greater than 110 bpm. |

ADVANCED PHYSIOLOGICAL OBSERVATIONS AND INDICATORS OF HEAT STRAIN

- | | | | |
|--------------------------|--------------------------|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Body core temperature is greater than 100.4° F. Body core temperature requires special measurement techniques. Contact your Regional Safety Coordinator or the Risk Management Department for details. or; |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 24-hour urinary sodium excretion is less than 50 mmoles. This requires special measurement techniques. Contact your Regional Safety Coordinator or the Risk Management Department for details. |

JOB SPECIFIC CONTROLS

- | | | | |
|--------------------------|--------------------------|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <u>Engineering Controls</u> -- Consider engineering controls that reduce worker metabolic rate; provide general air movement (with misters in dry climates) to improve evaporative cooling; provide air conditioning; reduce process heat and water vapor release, and shield radiant heat sources (especially tents or tarps to shield from direct radiant heat from the sun and indirect radiant heat from concrete/masonry walls and asphalt/concrete surfaces). |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <u>Administrative Controls</u> -- Consider administrative controls that set acceptable exposure times, allow sufficient recovery and limit physiological strain. Examples include work schedules that occur in early morning, late afternoon and evening hours; and rotation of workers to minimize extended day (longer than 8 hours) or multi-day consecutive exposures. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <u>Personal Protection</u> -- Consider PPE such as cool vests, special bandanas that retain water, and vortex cooling equipment. |

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1.0 Policy

Work sites, i.e., ATC offices, Client job sites, etc., shall be maintained in a clean, safe and orderly condition, for the protection of employees, Subcontractors, and the general public, and in compliance with applicable Regulatory requirements.

This Policy covers minimum performance standards applicable to all ATC Associates (ATC) employees, ATC Subcontractors, and locations. Local practices requiring more detailed or stringent rules, or local, State or other Federal requirements regarding this subject can and should be added as an addendum to this Policy as applicable.

2.0 Purpose

To define good housekeeping and sanitation procedures and practices.

3.0 Scope

Applies to all ATC Associates work sites, i.e., ATC offices, Client job sites, etc.

4.0 Definitions


Lavatory - means a basin or similar vessel used exclusively for washing of the hands, arms, faces, and head.

Number of Employees - means, unless otherwise specified, the maximum number of employees present at any one time on a regular shift.

Potable Water - means water that meets the quality standards prescribed in the U.S. Public Health Service Drinking Water Standards, published in 42 CFR part 72, or water which is approved for drinking purposes by the State or local authority having jurisdiction.

Toilet Room - means a room maintained within or on the premises of any place of employment, containing toilet facilities for use by employees.

Toxic Material - means a material in concentration or amount which exceeds the applicable limit established by a Regulatory standard, such as 1910.1000 and 1910.1001 or, in the absence of an applicable Standard, which is of such toxicity so as

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to constitute a recognized hazard that is causing or is likely to cause death or serious physical harm.

Water Closet - means a toilet facility maintained within a toilet room for the purpose of both defecation and urination and which is flushed with water.

5.0 Requirements

5.1 General Housekeeping

Work sites, vehicles, shops, warehouses, offices, and parking lot areas shall be kept in a clean and orderly condition. The floor of workrooms or the walking/working areas of project sites shall be maintained, as possible, in a dry condition. Where wet processes are used, drainage shall be maintained and false floors, platforms, mats, or other dry standing places shall be provided, where practicable, or appropriate waterproof footwear shall be provided.


To facilitate cleaning, every floor, working place, and passageway shall be kept free from protruding nails, splinters, loose boards, and unnecessary holes and openings.

During the course of construction, alteration, or repairs, form and scrap lumber with protruding nails, and all other debris, shall be kept cleared from work areas, passageways, and stairs, in and around buildings or other structures. Combustible scrap and debris shall be removed at regular intervals during the course of construction. Safe means shall be provided to facilitate such removal.

Containers shall be provided for the collection and separation of waste, trash, oily and used rags, and other refuse. Containers used for garbage and other oily, flammable, or hazardous wastes, such as caustics, acids, harmful dusts, etc. shall be equipped with tight-fitting covers. Garbage and other waste shall be disposed of at frequent and regular intervals.

Tools (service and emergency equipment) shall be kept clean and well maintained. When not in use all tools must be secured and stored in a manner that prevents incidental contact or damage.

Walkways, stairways and roadways shall be kept clear to allow the safe movement of persons, material and equipment. All exits must be properly maintained and free of any obstructions or impediments to full instant use in case of fire or other emergency.

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Where ATC employees will be working on a Client-owned project site, the Project Manager must receive permission from the Client to use any on-site trash collection receptacles. In the event that trash collection receptacles are not available, the Project Manager must ensure that all trash is collected in a timely manner and disposed of properly.

Electrical cords, hoses, ropes, conduit, pipe, and other hazards shall not be placed in walkways, stairways, and work areas in such a manner as to create a tripping hazard. Examples of acceptable methods for avoiding a tripping hazard include: Use of "Hold-Down" devices specifically designed to protect electrical cords and minimize trip hazards; taping the items down, running the items along the area edge, or barricading the area.

Scrap materials shall be stacked or stored for disposal or recycling in a neat and orderly manner so as not to interfere with job processes or create hazards. The designation of these areas should take place during the initial Tailgate Safety Meeting at the project site or during initial project scope development.

Employees shall keep their work areas in a clean and orderly manner. Inspections of general work areas should be conducted according to ATC Policy No. 07, Safety Systems/Health and Safety Plans. The results should be reported to the Project Manager and the Branch Safety Officer.


Emergency exits and evacuation routes shall be clearly marked and kept clear at all times.

5.2 Storage & Clearances

All materials stored in tiers shall be stacked, racked, blocked, interlocked, or otherwise secured to prevent sliding, falling, or collapse. Maximum safe load limits of floors within buildings and structures, in pounds per square foot, shall be conspicuously posted in all storage areas, except for floor or slab on grade. Maximum safe load limits shall not be exceeded. Non-compatible materials shall be segregated in storage.

Aisles and passageways shall be kept clear to provide for the free and safe movement of materials handling equipment or employees. Such areas shall be kept in good repair.

When a difference in road or working levels exist, means such as ramps, blocking, or grading shall be used to ensure the safe movement of vehicles between the two levels.

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When materials are stored on upper levels, adequate clearance must be provided to ensure that any fire sprinkler heads are not blocked. Generally, building and fire codes require at least eighteen (18) inches or more of clearance between stored materials and sprinkler heads to ensure no blockage of sprinkler spray patterns.

Adequate clearance (generally, a minimum of 30 inches) around electrical or emergency equipment must also be maintained at all times. This ensures quick access to that equipment when needed (such as during an emergency).

5.3 Potable Water

5.3.1 Potable Water Supplies

An adequate supply of potable water shall be provided at all ATC locations. The potable water system of Client facilities shall not be utilized without prior authorization.

5.3.2 Water Containers & Drinking Cups

Portable water containers used to dispense drinking water shall be capable of being tightly closed, and equipped with a tap. Under no circumstances should drinking containers or ladle type devices be dipped in potable water for drinking.


Any container used to distribute drinking water shall be clearly marked as to the nature of its contents and not used for any other purpose. Containers shall be emptied after every shift, cleaned with a cleaning solution, and allowed to air dry.

A common drinking cup shared among ATC employees, without proper sanitizing of the drinking cup, is prohibited. Where single service disposable cups are supplied, both a sanitary container for the unused cups and a trash receptacle for disposing of the used cups shall be provided.

5.4 Non-potable water

Non-potable water outlets (such as water for industrial or firefighting purposes only) shall be identified with signs to indicate clearly that the water is unsafe for drinking, washing, or cooking purposes.

There shall be no cross-connection, open or potential, between a system furnishing potable water and a system furnishing non-potable water.

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Non-potable water systems of Client facilities shall not be utilized without authorization. The Project Manager must work with the Client to identify potable and non-potable water sources for ATC employees.

5.5 Toilet Facilities

All ATC locations shall have toilet facilities available for use for ATC employees and allow for unrestricted access. In the event that restrictions must be placed on usage, then the Risk Management Department must be notified of this restriction and the reasoning for the restriction. Toilet facilities of Clients shall not be utilized without authorization.

The requirements of this Policy do not apply to mobile work crews or temporary project sites as long as all employees have access to transportation to nearby toilet facilities.

The minimum numbers of toilets (water closets) and urinals that shall be provided for employees at all ATC facilities are specified in local Building Codes and OSHA Regulations. All facilities shall meet or exceed the applicable Code and Regulations. For information on specific requirements, contact your Regional Safety Coordinator.


Toilet facilities shall be maintained in a sanitary condition and cleaned on a systematic basis.

5.5.1 Work Crews or Temporary Project Sites

Under temporary field conditions, provisions shall be made to ensure that ATC employees have access to sanitary toilet facilities. This may include the following:

- Privies (where employee use will not contaminate ground or surface water)
- Chemical toilets
- Recirculating toilets
- Combustion toilets
- Transportation to off-site toilet facilities.

Any temporary toilet facilities shall be maintained in a sanitary condition, cleaned on a systematic basis, and located centrally (as practical) to the project site.

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5.6 Washing facilities & Sanitation

5.6.1 General

Washing facilities shall be provided for all employees. Facilities shall be near the work area. Washing facilities shall be maintained in a sanitary condition. Client washing facilities shall not be utilized without permission.

5.6.2 Lavatories

All ATC locations shall have lavatories available for employees to use. This requirement does not apply to ATC temporary project sites as long as employees working at these locations have transportation readily available to nearby washing facilities that meet the requirements listed below.

- Each lavatory shall be provided with hot and cold running water, or tepid running water.
- Hand soap or similar cleansing agents.
- Hand towels or sections of cloth or paper, warm air blowers or clean individual sections of continuous cloth toweling near the lavatories.


5.6.3 Showers & Change Rooms

In general ATC office locations do not require the need for a Branch to have available showers for ATC employees. In the event that ATC employees are sent to a project site that requires the use of showers because of a Regulatory Standard, best practice, or Client requirements, then the Project Manager is responsible for assuring that all ATC employees have a shower area available.

The project specific Health and Safety Plan (HASP) should address the use of an on-site shower. The following requirements must be met when shower use is required.

- One shower shall be provided for each ten (10) employees of each sex, or numerical fraction thereof, who are required to shower during the same shift.
- Provide for soap or other appropriate cleansing agents.
- Hot and cold water feeding a common discharge line.
- Individual clean towels.

In general, ATC office locations do not require the need for a Branch to have available changing rooms for ATC employees. In the event that ATC employees are sent to a project site that requires the use of changing

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rooms because of a Regulatory Standard, best practice, or Client requirements, then the Project Manager is responsible for assuring that all ATC employees have a designated changing room.

The project specific Health and Safety Plan (HASP) should address the use of an on-site changing room.

5.6.4 Personal Hygiene

Providing sanitary facilities to employees and allowing access to those facilities helps to decrease the spread of contamination and illness in the work place. Employees should be encouraged to wash their hands prior to eating or drinking and remove contaminated clothing before leaving the work area.

5.7 Eating and Drinking Areas

All ATC locations shall have an area for employees to eat in that is maintained in a sanitary condition. At no time should an employee be allowed to consume food or beverages in a toilet room or in any area exposed to a toxic material. If necessary, a Branch Manager should post signs indicating no eating or drinking in these areas.


5.8 Vermin control

For the protection and comfort of ATC employees and visitors, every ATC location should be maintained in a manner that discourages the harboring of pests and prevents them from entering ATC facilities. A continuing and effective extermination program by a licensed and trained exterminator shall be instituted whenever the presence of a pest is detected.

5.9 Temporary Sleeping Quarters


In the event that a project requires that ATC employees stay overnight the Project Manager shall ensure that adequate hotel or motel rooms are available per ATC Policy. All temporary sleeping quarters must be heated, ventilated, and lighted.

6.0 Appendices

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7.0 References

- Occupational Safety and Health Administration (OSHA), 29 CFR Part 1926 Subpart C, 1926.25, Housekeeping.
- Occupational Safety and Health Administration (OSHA), 29 CFR Part 1926 Subpart C, 1926.34, Means of Egress.
- Occupational Safety and Health Administration (OSHA), 29 CFR Part 1926 Subpart H, 1926.250, General Requirements for Storage.
- Occupational Safety and Health Administration (OSHA), 29 CFR Part 1910 Subpart J, 1910.141, Sanitation.

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1.0 Policy

It is the policy of ATC Associates Inc. that all employees are entitled to be informed of the known health hazards of any hazardous chemical used in the work place.

This policy covers minimum performance standards applicable to all ATC Associates employees and locations. Local practices requiring more detailed or stringent rules, or local, state or other federal requirements regarding this subject can and should be added as an addendum to this procedure as applicable.

2.0 Purpose

The following information represents the written Hazard Communication Program for ATC Associates Inc. as required by the Occupational Safety and Health Administration Standards 29 CFR 1910.1200 and 29 CFR 1926.59. The purpose of this written program is to establish ATC policy, procedures, and responsibilities for dissemination of information to employees regarding the safe use and handling of hazardous chemicals to which they are exposed or potentially exposed.


3.0 Scope

This Hazard Communication Program shall apply to all ATC employees who are exposed or potentially exposed to hazardous chemicals. This includes employees who may be exposed under normal conditions of use or in a foreseeable emergency.

This manual section and its Addendum shall serve as the ATC written Hazard Communication program.

Note: The following items are excluded from this program and the requirement to inventory:

- Any hazardous waste defined by the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act of 1976
- Tobacco or tobacco products
- Wood or wood products
- Articles, defined as:
 - A manufactured item which is formed to a specific shape or design during manufacturing, and
 - Which has end use function(s) dependent in whole or in part upon its shape or design during end use, and

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Which does not release, or otherwise result in exposure to a hazardous chemical during normal use.

- Food, drugs, cosmetics, or alcoholic beverage in a retail establishment which are packaged for sale to consumers and food, drugs, cosmetics intended for personal consumption by employees in the workplace.
- Any consumer product or hazardous substance, as those defined in the consumer Product Safety Act and Federal Hazardous Substances Act where the product is used in the work place in the same manner as normal consumer use, and which is not a greater exposure than experienced by consumers.

4.0 Definitions

Acute health hazard means a hazard that usually occurs rapidly following a brief exposure, such as a skin rash or eye irritation.

Article means a manufactured item which:

- is formed to a specific shape and design during manufacture
- has end use functions dependent upon its shape or design during end use, and
- under normal use conditions, does not release more than trace amounts of a hazardous chemical and does not pose a physical hazard or health risk to employees

Chemical means any element, chemical compound or mixture of elements and/or compounds.


Chemical manufacturer means an employer with a workplace where chemicals are produced for use or distribution.

Chemical name means a name that will clearly identify the chemical for the purpose of hazard evaluation.

Chronic health hazard means a hazard that is continuous and follows repeated long-term exposure - such as lung cancer or kidney disease.

Common name means a brand name used to identify a chemical by other than its chemical name.

Container means a bag, barrel, bottle, box, can, cylinder, drum, reaction vessel, storage tank, or the like that contains a hazardous chemical.

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Employee means a worker who may be exposed to hazardous chemicals under normal operating conditions or in foreseeable emergencies.

Employer means a person engaged in a business where chemicals are used, distributed, or produced for use or distribution, including a contractor or subcontractor.

Foreseeable emergency means any potential occurrence that could result in an uncontrollable release of a hazardous chemical in the workplace.

Hazardous chemical means any chemical that is a physical hazard or a health hazard.

Hazard warning means any words, pictures, symbols or combination of words, pictures, or symbols appearing on a label or other appropriate form of warning which convey the specific physical or health hazards.

Health hazard means a chemical for which there is statistically significant evidence based on a least one study conducted in accordance with established scientific principles that acute or chronic health effects may occur to exposed employees.

Label means any written, printed, or graphic material displayed on or affixed to containers of hazardous chemicals.

Material Safety Data Sheet (MSDS) means written or printed material concerning a hazardous chemical.

Physical Hazards means a chemical that acts outside the body to produce a dangerous situation. Flammable or explosive chemicals pose physical hazards.

Responsible party means someone who can provide additional information on the hazardous chemical and appropriate emergency procedures, if necessary.


Use means to package, handle, react, emit, extract, generate a byproduct, or transfer.

5.0 Requirements

5.1 Responsibilities

The Branch Safety Officer at each ATC office is responsible for implementing the Hazard Communication Program at his or her facility. Specifically, the Branch Safety Officer will:


- 1) Assemble and maintain the master inventory of chemicals at this ATC office.

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- 2) Develop and conduct appropriate training and information programs to promote methods for the safe use and handling of hazardous chemicals for current and new employees.
- 3) Provide technical guidance to supervisors and personnel at all levels of responsibility on matters pertaining to health and safety.
- 4) Inspect laboratories, garages, and other work areas semi-annually to assess compliance with policies for the safe conduct of work involving hazardous chemicals.
- 5) Investigate reported accidents which result in the exposure of personnel or the environment to hazardous chemicals and recommend corrective action to reduce the potential for reoccurrence.
- 6) Supervise decontamination operations where accidents have resulted in significant contamination of laboratory and general work areas.
- 7) Verify that each Branch and Division Manager is meeting labeling and material safety data sheet requirements as specified in this program.
- 8) Investigate and report to the Regional Safety Coordinator any problems pertaining to the operation and implementation of safe work practices and this Hazard Communication Program.
- 9) Maintain appropriate documentation for the Hazard Communication Program.

Branch, and Division Managers are responsible for ensuring compliance with requirements of the Hazard Communication Program as it relates to their areas of operational responsibility. Specifically, he or she is responsible for:

- 1) Acquiring the knowledge and information needed to recognize and control chemical hazards in the work place.
- 2) Ensuring that inventory, training, labeling, and MSDS requirements of the program are met.
- 3) Selecting and employing work practices and engineering controls that reduce the potential for exposure to hazardous chemicals to the lowest practical level.
- 4) Ensuring that employees, for whom the supervisor is responsible, receive training as described in part 5.8 of this section. This shall include instructing

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employees in the use of site- or task-specific work practices, engineering controls, and procedures for prevention of, and response to, accidents and exposures involving hazardous chemicals.

- 5) Supervising the safety performance of his or her staff to ensure that the required work practices and engineering controls are employed.
- 6) Arranging for appropriate medical attention and reporting to the Corporate Director of Health and Safety and the local Safety Officer any incident which results in potential overexposure or injury from a hazardous chemical.
- 7) Investigating and reporting to the Branch Safety Officer any problems pertaining to the operation and implementation of safe work practices and this Hazard Communication Program.

5.2 Chemicals - Handling, Storage, Transport & Disposal


Because of the toxicity, flammability, reactivity, and corrosivity hazards of many of the chemicals that ATC personnel utilize, it is important that usage guidelines be followed. Not only must chemicals be carefully handled for safety reasons but also very strict regulatory and legal protocols dictate that ATC store, transport, and dispose of such chemicals in a very specific manner.

The following section applies to all ATC divisions who utilize chemical substances, collect chemically contaminated samples, and generate chemical wastes.

5.2.1 Handling

5.2.1.1 General

- 1) When handling any chemical, contaminated sample, or waste material, ATC employees **must** utilize appropriate protective equipment. The type and amount of equipment will vary depending upon the substance. Specific recommendations can be obtained by consulting material safety data sheets, reference books, or by contacting the Corporate Health and Safety Department. More details regarding protective equipment policy can be found in section 25 of this manual.
- 2) When working with or around any chemical substance, become familiar with the chemical and the hazards associated with it. This information can be obtained from material safety data sheets.

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- 3) When using any chemical, ensure that its container is properly labeled per section 5.6 of this policy.
- 4) Large bottles of liquid chemicals (e.g. 4-liter bottle of acetone) should be placed in a non-breakable protective caddy when in use.
- 5) When using chemicals in the laboratory, etc., only keep the amount of chemicals at hand that are necessary to complete the task.
- 6) Volatile and/or toxic chemicals should be handled only in a well-ventilated area. Preferably this should be a chemical fume hood exhausted outside the building.
- 7) Emergency equipment such as first aid kits, fire extinguishers, eyewash, and emergency shower must be readily available within close proximity.


5.2.2 Chemical Storage

Chemicals should be stored by their reactive class with incompatibles physically separated from one another. The following sections cover some of the major chemical classifications and specific requirements.

5.2.2.1 Storage Areas

Hazardous chemical substances must be stored in specifically designated storage areas or cabinets which meet the following safety criteria:

- 1) Storage areas/cabinets must be marked or identified as such.
- 2) Storage areas/cabinets should be secured whenever not in use and must be available only to authorized personnel.
- 3) Storage areas must be well illuminated and well ventilated with exhaust air leaving the building.
- 4) Open flames, smoking, and localized heating units are not permitted in storage areas.

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- 5) Cleanliness and order must be maintained in the storage areas. Packing material and empty cartons should be removed promptly from the stockroom.
- 6) A class A,B,C-rated fire extinguisher must be mounted within 50 feet of the chemical storage area. If there are chemicals for which an A,B,C fire extinguisher is not effective, an additional fire extinguisher of the appropriate rating must also be mounted within 50 feet.
- 7) No chemical storage is permitted on the floor or above eye level.
- 8) Chemical containers must not be crowded onto storeroom shelves. Containers must not protrude over the shelf edges.
- 9) All shelving must be level and stable.
- 10) Laboratory fume hoods must not be used for chemical storage.

5.2.2.2 Storage Containers

- 1) All chemical containers must be labeled as specified by section 5.6 of this policy.
- 2) Storage containers must be inspected periodically for rust, corrosion, or leakage.
- 3) Damaged containers must be removed or repaired immediately.
- 4) Chemicals must be kept in airtight containers. Beakers or open vessels are not acceptable for storage.

5.2.2.3 Corrosives

- 1) Acids and caustics must be physically separated in storage.
- 2) Oxidizing acids (e.g. nitric, perchloric, sulfuric) must be segregated from organic acids (e.g. acetic, butyric, citric, oleic, oxalic, stearic), flammable, and combustible materials.
- 3) Acids must be separated from active metals such as sodium, magnesium, and potassium.

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- 4) Segregate acids from chemicals which can generate toxic gases on contact (e.g. sodium cyanide, iron sulfide, etc.).
- 5) Corrosives should be stored in glass or polyethylene containers rather than metal, wood, or other potentially reactive containers.
- 6) Bottle carriers should be used when carrying corrosives from the storage area.

5.2.2.4 Flammables

- 1) OSHA/NFPA-specified safety cabinets with FM or UL approval should be used for the storage of flammable liquids. This includes cans of gasoline, mineral spirits, etc.
- 2) Only approved refrigerators should be used for storing highly volatile flammable liquids.
- 3) In areas with highly volatile flammable atmospheres, all electrical service equipment must be explosion proof for the appropriate class and group of flammable.
- 4) Flammable and combustible liquids shall be stored in approved containers [refer to 29 CFR 1910.106(d)(2) for details]. Containers shall be kept in closed when not in use.
- 5) Flammable liquids in large quantities (over 4 liters) should be kept in UL or FM approved safety cans with flash arresters. **This includes portable gasoline containers.**
- 6) Extreme care must be exercised when transferring flammable liquids from one container to another. To prevent a static electricity discharge, bulk containers **MUST** be grounded. Transfer containers must then be bonded, via a bonding cable or metal pouring spout, to the bulk container.

5.2.2.5 Oxidizers

Many oxidizers can be extremely reactive when mixed with incompatible substances. Some oxidizers may decompose and react on their own if exposed to heat, light, shock, or friction. Special storage precautions and care must be exercised when using such materials.

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Examples of oxidizers include many acids (e.g. nitric, perchloric, sulfuric), hydrogen peroxide, chlorine, fluorine, nitrous oxide, and compressed oxygen. Refer to labels and MSDS to find out if a chemical is an oxidizer.

- 1) Store oxidizers away from flammables, combustibles, and reducing agents (e.g. zinc, alkaline metals, etc.).
- 2) Peroxide forming chemicals (e.g. hydrogen peroxide, ethyl ether, etc.) must be stored in airtight containers in a dark, cool, and dry place.
- 3) Peroxide-forming chemicals must be periodically inspected and disposed of before the date of expected peroxide formation.
- 4) **No container should be handled if there is suspicion of peroxide contamination. Immediately contact the Corporate Director of Health and Safety in such circumstances.**

5.2.2.6 Compressed Gases


Not only do compressed gas cylinders frequently contain hazardous substances, but the additional high pressure hazard warrants the need to exercise extreme caution.

- 1) Gas cylinders (including small calibration cylinders) must be appropriately labeled.
- 2) Gas cylinders must be securely chained to a stationary structure in an upright position. Small calibration gas cylinders must be stored in lockable cabinets.
- 3) Gas cylinders must be stored away from direct heat, open flames, sparks, highly flammable substances, and corrosives.

SPECIAL NOTE:

Compressed oxygen cylinders that are in storage must be stored at least 20 feet from compressed fuel gas cylinders and flammables (especially oil and grease) or must be physically separated by a 5' non-combustible barrier.

- 4) Empty gas cylinders should be marked as such and stored separately from full cylinders.

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- 5) When gas cylinders are not in use, the valve cap must be securely in place to protect the valve stem and valve.
- 6) Use a hand truck to transport gas cylinders to and from the storage area.

5.2.3 Waste Chemical Storage

Chemical wastes are produced on a routine basis in some ATC laboratories. These waste materials must be stored in a safe and secure manner until appropriate disposal can be arranged. Hazardous waste from project sites (e.g. drums of contaminated soil, water, gasoline, etc.) must not be taken to the local ATC office. Appropriate disposal arrangements should be made for pick up from the project site.

5.2.3.1 Waste Chemical Containers


Waste chemicals must be stored in a manner consistent with the criteria outlined in section 5.2.2 of this procedure.

- 1) It is extremely important that waste containers (drums, cans, etc.) are clearly labeled as to their contents.
- 2) The containers themselves must be compatible and sturdy. **For large volumes, glass bottles or jars are inappropriate waste containers because of the potential for breakage.**
- 3) Safety cans should be utilized for the collection of waste flammables.

5.2.3.2 Hazardous Waste Storage Areas

The following guidelines should be utilized to safely store hazardous wastes at an ATC office.

- 1) Only personnel specifically trained on the hazards of the waste material shall be allowed to handle it.
- 2) Personnel must be properly protected with appropriate clothing and gloves and, if necessary, respirator when handling or transferring hazardous waste.
- 3) The waste storage area must be non-cluttered and spacious enough to allow safe handling and placement of containers.

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- 4) The storage area must be well ventilated to prevent a build up of toxic or flammable vapors. Natural ventilation may be used (outside storage) or an explosion-proof exhaust system may be used.
- 5) In order to avoid container leakage, pressure build up, hazardous polymerization, etc., wastes should be stored out of the rain, snow, high heat, or extreme cold.
- 6) For large quantities of hazardous waste, a secondary containment berm or tray in the storage area is necessary to provide containment in the event of leakage or spills. The containment should be capable of holding 10-15% of the waste's volume.
- 7) All electrical service, including lighting, in a waste storage area which contains highly flammable materials must be explosion proof.
- 8) All hazardous waste storage areas must be secured to prevent unauthorized entry.

5.2.3.3 Disposal

- 1) All waste chemicals and unneeded or outdated chemicals must be disposed of in an appropriate manner by a qualified disposal company.
- 2) **Chemical waste or contaminated samples must not be disposed of in solid waste dumpsters or via the sanitary sewer unless specific approval has been received from all governing state and local regulatory agencies.**
- 3) No chemical waste must be allowed to accumulate at an ATC facility for longer than 90 days.
- 4) Manifests from all chemicals being disposed of must be retained indefinitely at the local ATC office.

5.2.4 Transport

Because of safety and liability concerns, no ATC employee shall transport hazardous wastes over the road. Appropriate arrangements must be made

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prior to job start up regarding the ultimate disposal of any wastes generated on site.

Quantities of chemical products needed to conduct routine operations such as gasoline, acetone, methanol, etc. may be transported as long as the following conditions are met.

5.2.4.1 General Requirements

- 1) Containers must be properly labeled as per the requirements of section 5.6 of this policy.
- 2) Gasoline must be transported in UL or FM approved safety cans with flash arresters.
- 3) Chemical containers must be air-tight and placed in non-breakable protective enclosures.
- 4) Large tanks (e.g. over 1001 lbs. or roughly 100 gallons) for gasoline, diesel fuel or other flammables / combustibles in support vehicles must be securely mounted and placarded with the appropriate DOT placard information and number.
- 5) Material safety data sheets for the chemicals must be transported in the vehicle

5.3 Written Hazard Communications (Hazcom) Program

As an Addendum, each ATC Branch shall develop its own specific written Hazard Communication Program elements addressing the requirements of 5.3 through 5.10.


An evaluation of the effectiveness of the Hazard Communication Program shall be conducted annually by the ATC Branch Safety Officer.

5.4 Hazard Communication (HAZCOM) Coordinator

A HAZCOM Coordinator shall be the Branch Safety Officer or a designated person or the senior person at any work site.

The HAZCOM Coordinator shall be knowledgeable of requirements of the OSHA Hazard Communications Standard.

5.5 Hazard Determination and Chemical Inventories

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Each ATC office and fixed jobsite must maintain an inventory of the chemicals known to be present in the work place. Each inventory shall list the hazardous chemicals/products by an identity that is referenced on the appropriate material safety data sheet and indicate the location of the chemicals/products. Each Division Manager and/or Project Manager is responsible for compiling the inventory for his or her own hazardous chemicals.

Inventories are assembled by the Safety Officer into a master inventory which is listed as Appendix 21-A of this Hazard Communication Program.

The Division Manager is responsible for notifying the Safety Officer and employees, within his or her department, within 30 days of the receipt of a new chemical. The Branch Safety Officer must update the master inventory as departmental chemical inventories are updated.

The hazardous chemical inventories are to be audited annually by the Safety Officer to verify that the Division Managers have appropriately accounted for and reported their hazardous chemicals.


5.6 Labels and other forms of warnings shall contain:

- The identity of the hazardous chemical(s)
- Appropriate hazard warnings
- Name and address of the chemical manufacturer, importer, or other responsible party

Chemicals received by each department will be labeled by the Division Manager unless an appropriate label exists from the manufacturer. The Hazardous Materials Information System (HMIS) as outlined in Appendix 21-C has been adopted by ATC and may be used. A wall chart explaining this system shall be prominently posted within each department if the HMIS system is used. The HMIS labels may be used in addition to existing manufacturer hazard warning labels. Employees should not deface or remove existing labels.

Transfer containers (including safety cans, etc.) must also be labeled. The only exception is for portable containers into which hazardous chemicals are transferred from labeled containers and are intended for the immediate (within the same work shift) use by the employee who performed the transfer.

A label audit shall be performed annually by the Safety Officer to ensure that containers of hazardous materials have been properly labeled.

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5.7 Material Safety Data Sheets (MSDS)

The most current MSDS available shall be utilized.

A master set of MSDSs shall be maintained at each ATC Branch office.

MSDSs for a specific work area shall be established, maintained and made available to employees in designated locations within these areas. Such compilations can be unique to the work area, e.g. sets for Service Technicians on vehicles, tool rooms, shop areas, long-term service site, etc.

Each ATC office maintains copies of material safety data sheets for each hazardous chemical used. The MSDS provides information for employee and employer review including:


- Product name, common or trade name, manufacturer's name, address, and telephone number
- Health hazard information
- Emergency first aid procedures
- Fire, explosion, and reactivity data
- Personal protective equipment
- Handling and storage information
- Medical management
- Exposure limits
- Physical and chemical properties
- Additional comments

Chemical manufacturers or distributors are required by the Hazard Communication Standard to supply a complete MSDS for each hazardous chemical sent to ATC. It is the responsibility of the Division Manager to contact all manufacturers and distributors who do not send an MSDS or who send an inadequate MSDS.

A written request for MSDS may be made to the manufacturer using the form letter found in Appendix 21-B. A copy of any incomplete or inadequate MSDS should be attached to the request when sent to the manufacturer or distributor. Each Department Manager is responsible for informing the Safety Officer when MSDS are added or deleted.

5.8 Employee Information and Training

ATC shall provide employees with effective information and training on hazardous chemicals in their work area at the time of their initial assignment, and whenever a new physical or health hazard the employees have not been trained about is introduced into their work area. Information and training may be designed to cover categories of hazards (i.e., flammability, carcinogenicity, etc.) or specific chemicals.

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Chemical-specific information must always be available through labels and material safety data sheets. Labels and MSDSs shall be legible in English. However, for any non-English speaking employees, information and training shall be presented in their language as well. The information and training shall consist of at least the following:

5.8.1 Information


Employees shall be informed of:

- The requirements of 29 CFR 1910.1200;
- Any operations in their work area where hazardous chemicals are present; and
- The location and availability of the written hazard communication program, including the required list(s) of hazardous chemicals (inventory), and material safety data sheets required by 29 CFR 1910.1200.

5.8.2 Training

Employee training shall include at least:

- Employee's "Right to Know", and general requirements of 1910.1200;
- The physical and health hazards of the specific chemicals or classes of chemicals in the work area;
- The details of this Hazard Communication Program, including an explanation of the labeling system and the material safety data sheets, and how employees can obtain and use the appropriate hazard information;
- Methods and observations that may be used to detect the presence or release of a hazardous chemical in the work area (such as air sampling, direct reading instruments, visual appearance or odors of hazardous chemicals when being released, etc.); and,
- The measures employees can take to protect themselves from the hazards, such as appropriate work practices, emergency procedures, engineering controls, and personal protective equipment.
- This information and training will be conducted by the Safety Officer with input and assistance from the employee's supervisor. Web-based or computer-based training programs are acceptable provided that completion of the course and any supplemental site-specific training will satisfy OSHA training requirements, and the course is approved by the Corporate Director of Health and Safety.

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5.8.3 Training Documentation

Each ATC employee trained in hazard communication must sign off on the training acknowledgment form provided in Appendix 21-D or at the end of the HAZCOM-CBT program. Copies of this document are to be issued to the employee and the original shall be retained in the employee's personnel file.

5.9 Owner, Contractor and Multi-Employer Worksites

Contractors/employers entering an ATC office whose employees may be exposed to chemicals controlled/owned by ATC will be informed by the Branch Safety Officer or their designee of the ATC Hazard Communication Program. Where ATC is working at a multi-employer workplace, the on-site ATC individual in charge of ATC's operations will inform any other contractor/employer whose employees may be exposed to chemicals controlled/owned by ATC of the ATC Hazard Communication Program. This information will include:


- * The location and contents of the written Hazard Communication Program;
- * The location of and on-site access to material safety data sheets;
- * The precautionary measures that need to be taken to protect employees during the workplace's normal operating conditions and in foreseeable emergencies; and,
- * The labeling system used to label ATC's chemicals.

A "Multi-Employer Workplace Hazard Communication Information Sheet" will be filled out by the Safety Officer or on-site representative and presented to the contractor/employer for their signature (see Appendix 21-E).

Any employer/contractor must also alert ATC of the hazards of chemicals brought to the office/work site which ATC employees may be exposed to. This may include paints, solvents, or even welding fumes. The contractor must make readily available MSDSs for these chemicals.

5.10 Non-Routine Tasks

Hazard Communication plans for non-routine tasks shall include:

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- the method used to identify the hazards of non-routine tasks
- the methods used to inform employees of these hazards
- a description of special procedures required for hazardous non-routine tasks

In the event of non-routine tasks (e.g. spill clean up, unique sampling or analytical procedures, etc.), the Project Manager or Branch Safety Officer must ensure that the affected employee(s) has been properly briefed regarding the chemical hazards associated with the operation. Material safety data sheets for the chemicals must be made available.

Due to the varied workplaces ATC employees may occupy, there is a potential of encountering unlabeled pipes which may contain hazardous chemicals. As a precaution, ATC employees will consider all unlabeled pipes to contain hazardous chemicals. If any leaks or releases from unlabeled pipes are encountered, ATC employees will immediately leave the work area and report the incident to the appropriate facility manager.

ATC employees will only reenter these areas after the leak/release has been eliminated and an appropriate clean-up conducted or if the pipe contents are verified to be non-hazardous.

6.0 References

OSHA 29 CFR 1910.1200

OSHA 29 CFR 1926.59

Appendix 21-A
Hazard Communication Inventory of Products
(Branch: _____)

Date Conducted: _____
Conducted By: _____

[illegible]



Appendix 21-B

Form 21-1.2

MSDS REQUEST FORM LETTER

Date: _____

Re: MSDS for (Product Name)

Dear: _____

In an effort to comply with the OSHA Hazard Communication Standard (29 CFR 1910.1200), I am requesting that an updated Material Safety Data Sheet (MSDS) for (Product Name) be immediately sent to my attention at the following address:

ATC Associates Inc.

Thank you for your cooperation in this matter.

Sincerely,

Safety Officer



Appendix 21-C

Form 21-1.3

HMIS LABELING SYSTEM

The Hazardous Material Information System (HMIS) is a labeling system adopted by ATC Associates and was developed by the National Paint and Coatings Association (NPCA). The HMIS system uses a label with four color bars and a space at the top where the name of the chemical should be written. The blue, red, and yellow colored bars indicate, respectively, the health, flammability, and reactivity hazard associated with the material. These three bars use a numbering scale ranging from 0 to 4. A value of zero means that the material poses essentially no hazard; a rating of four indicates extreme danger.

Name of Material	
<input type="text"/>	HEALTH
<input type="text"/>	FLAMMABILITY
<input type="text"/>	REACTIVITY
<input type="text"/>	PROTECTIVE EQUIPMENT



Severity Range using the HMIS System

HEALTH

- 4 Deadly: even the slightest exposure to this substance would be life threatening. Only specialized protective clothing, for these materials, should be worn.
- 3 Extreme Danger: serious injury would result from exposure to this substance. Do not expose any body surface to these materials. Full protective measures should be taken.
- 2 Dangerous: exposure to this substance would be hazardous to health. Protective measures are indicated.
- 1 Slight Hazard: irritation or minor injury would result from exposure to this substance. Protective measures are indicated.
- 0 No Hazard: exposure to this substance offers no significant risk to health.

FLAMMABILITY

- 4 Flash Point Below 73°F and Boiling Point Below 100°F: this substance is very flammable, volatile or explosive depending on its state. Extreme caution should be used in handling or storing of these materials.
- 3 Flash Point Below 100°F: flammable, volatile or explosive under almost all normal temperature conditions. Exercise great caution in storage or handling of these materials.
- 2 Flash Point Below 200°F: moderately heated conditions may ignite this substance. Caution procedures should be employed in handling.
- 1 Flash Point Above 200°F: this substance must be preheated to ignite. Most combustible solids would be in this category.
- 0 Will Not Burn: substances that will not burn.



































REACTIVITY

- 4 May Detonate: substances that are readily capable of detonation or explosion at normal temperatures and pressures. Evacuate area if exposed to heat or fire.
- 3 Explosive: substances that are readily capable of detonation or explosion by a strong initiating source, such as heat, shock or water. Monitor from behind explosion-resistant barriers.
- 2 Unstable: violent chemical changes are possible at normal or elevated temperatures and pressures. Potentially violent or explosive reaction may occur when mixed with water. Monitor from a safe distance.
- 1 Normally stable: substances that may become unstable at elevated temperatures and pressures or when mixed with water. Approach with caution.
- 0 Stable: substances which will remain stable when exposed to heat, pressure or water.

PPE Symbols used by the HMIS



In the HMIS system, the fourth, white bar is used to indicate what Personal Protective Equipment (PPE) must be used in order to handle the material safely. A letter, often supplemented by icons or pictograms, is used to indicate what set of PPE should be used.

Symbol	Personal Protective Equipment (PPE) Required
A	 Safety Glasses
B	  Safety Glasses Gloves
C	   Safety Glasses Gloves Apron
D	   Face Shield Gloves Apron
E	   Safety Glasses Gloves Dust Respirator
F	    Safety Glasses Gloves Apron Dust Respirator
G	   Safety Glasses Gloves Vapor Respirator
H	    Splash Goggles Gloves Apron Vapor Respirator
I	   Safety Glasses Gloves Dust and Vapor Respirator
J	    Splash Goggles Gloves Apron Dust and Vapor Respirator
K	    Air Line Hood or Mask Gloves Full Suit Boots
X	Ask supervisor or safety specialist for handling instructions.





Appendix 21-D

Form 21-1.4

HAZARD COMMUNICATION TRAINING ACKNOWLEDGMENT

This is to certify that the undersigned has successfully completed ATC's Hazard
Communication Training program on _____.
(date)

As part of this training, the local Safety Officer has identified the location of the Chemical
Inventory and the Material Safety Data Sheet file. The undersigned Safety Officer has issued a
copy of the written ATC Hazard Communication Program.

Employee Name, printed

Employee Signature

Date

ATC Office/Division

Branch Safety Officer Signature

Date

cc: ☐ Employee ☐ Branch Safety Officer ☐ Personnel File



Appendix 21-E

Form 21-1.5

**MULTI-EMPLOYER WORKPLACE
CONTRACTOR HAZARDOUS CHEMICAL INFORMATION SHEET**

1. Work Area:_____ Supervisor:_____

2. Contractor:_____

3. Work to be performed:_____

4. Hazardous chemicals present:_____

5. Appropriate protective measures:_____


6. Contractor's/Employer's acknowledgment:

I have been informed of the hazards of the chemicals present in the area where my employees will be working and of the appropriate protective measures. I take full responsibility for ensuring that my workers follow safe working procedures and take the appropriate protective measures. Material Safety Data Sheets have been made available where applicable. I have informed ATC representatives of all hazardous materials which I have brought onto ATC property/worksites and have made available Material Safety Data Sheets where applicable.

_____ Date:_____
Signature of Contractor/Employer Representative

_____ Date:_____
Signature of ATC Representative

* Please place a copy of this form in the project file (if applicable) and provide a copy to the Safety Officer *

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1.0 Policy

It is the responsibility of each Manager/Supervisor to assure that appropriate first-aid and medical response capabilities are provided to ATC employee, both at the Branch environment and at ATC project sites.

This policy covers minimum performance standards applicable to all ATC Associates employees and locations. Local practices requiring more detailed or stringent rules, or local, State or other Federal requirements regarding this subject can and should be added as an addendum to this procedure as applicable.

2.0 Purpose

This first-aid and medical services procedure is designed to establish specific common guidelines for ATC Branches to follow in assuring that prompt medical attention is provided to employees suffering from either a work related or non-work related injury or illness. This includes the use of “Universal Precautions” and specific Personal Protective Equipment (PPE) for minimizing potential exposure to Bloodborne Pathogens.


3.0 Scope

Applies to all ATC Associates work sites, i.e., ATC offices, client job sites, etc., and includes visitors, vendors, and subcontractors.

4.0 Definitions

Bloodborne Pathogens – means pathogenic microorganisms that may be present in a person’s blood or other body fluids or tissues. These pathogens include, but are not limited to, Hepatitis B Virus (HBV) and Human Immunodeficiency Virus (HIV). These are a significant hazard when responding to injuries and providing first-aid and/or CPR.

COMP-CARE – means the Injury Assessment Service provided by Health Resources. This is a 24/7 link to registered professional nurses that can help assess an injury or illness and, where deemed necessary, refer the injured employee to an occupational medical clinic. COMP-CARE assists ATC in the management of cases from initial call until employee is fully recovered from the injury or illness.

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Established Medical Treatment Facility - means the occupational medical treatment provider and/or emergency care center identified as being capable of, and established by an ATC location, to initially treat employee injuries and illnesses.

First-Aid - means the basic response to an injury or illness, and the process to assist the injured party until more qualified personnel, such as an Emergency Medical Technician (EMT) arrive or the injured party arrives at a local clinic or other medical care facility.

First-Aid Kit – means the readily-available container that holds a supply of basic first-aid materials and supplies, including personal protective equipment (PPE), to assist in providing basic first-aid to the injured party.

Illness – means a skin disease/disorder, respiratory condition, poisoning, thermal stress (heat or cold) or other conditions resulting from an event or exposure in the work environment. Illnesses, as compared to injuries, are typically a result of a more prolonged exposure to a given physical hazard or health hazard in the workplace.

Injury - means any wound or damage to the body resulting primarily from a one-time event or exposure in the work environment. This includes burns, broken bones, cuts or lacerations, punctures, abrasions, contusions or bruises, insect bites, and sprains or strains.

Medical Treatment - means the managing and caring for a patient for the purpose of combating disease or disorder. Medical treatment does not include basic first-aid procedures and treatment, even if provided by a health care professional such as a physician. OSHA defines the differences between Medical Treatment and First-Aid in the recordkeeping regulations


Work-Related Injury or Illness - means an injury or illness resulting from an event or exposure in the work environment causing or contributing to the condition or significantly aggravating a preexisting condition.

Work Environment - means work sites where one or more employees are present as a condition of their employment.

5.0 Requirements

5.1 Injury Assessment Service (COMP-CARE)

ATC subscribes to an “Injury Assessment Service” provided by Health Resources. This service is called COMP-CARE and is available by toll-free

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number on a 24/7 basis. This service is staffed by an Occupational Medical Director and Registered Professional Nurses.

COMP-CARE must be promptly called (by Supervisor and/or Employee) for all non-life-threatening occupational injuries and illnesses. The Nurse will ask questions about the injury or exposure and will assist with self-care of the injury or exposure. Where deemed necessary, the Nurse will, based upon the responses by the employee, provide recommendations to the injured party to seek additional medical care at the designated occupational medical clinic or a local Emergency Room.

The Nurses will follow-up with the medical care provider(s) to communicate that ATC Associates has an active Return-to-Work (RTW) Program that allows for accommodation of injured employees allowing them to return to work, even if in a “restricted-duty” capacity. The Nurses will continue to monitor and assist in the management of the case, and track the progress of the employee through a full recovery. COMP-CARE provides routine updates of cases to the Risk Management Department.


A posting that includes the toll-free number for contacting COMP-CARE must be posted at each ATC fixed facility. This number is also included on the ATC Lifelines cards. An example of the posting is shown at Appendix 20-01.

NOTE: If an employee declines First-aid and/or medical treatment for a reported on-the-job injury after the Supervisor recommends it, that employee should NOT be allowed to continue work. Supervisors should discuss each situation with the Branch Safety Officer or Project Manager before allowing that employee to return to duty.

5.2 Designated Medical Treatment Facility

ATC Associates will ensure that readily available medical personnel are available to employees to provide advice and consultation regarding matters of employee occupational health.

Each fixed facility and fixed jobsite must identify and post the location of a designated medical treatment facility and/or emergency care center including name, address, telephone number, and hours of operation. This information should be posted in a conspicuous location at each fixed facility or fixed job site. The designated medical treatment facility or emergency care center should maintain similar hours of operation as the facility and be able to respond to a workplace emergency within a reasonable amount of time.

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Appendix 20-02 shows an example of a posting that should be displayed in a conspicuous location at each fixed facility or fixed job site. Many medical providers have and will provide their own posting. The Branch Safety Officer must determine if the posting has the necessary elements needed to inform employees regarding the designated medical treatment facility.

5.3 First-Aid & CPR Training

Employee training in basic First-Aid and Cardiopulmonary Resuscitation (CPR) is encouraged because of its value and benefit to individuals, their families and the community.

The company also supports any employee who, while on the job, chooses to act as a “Good Samaritan” to assist a fellow employee or another person with first-aid or CPR. It is ATC’s intent that first-aid supplies and basic PPE for protection against bloodborne pathogens be accessible to employees at every work site during all shifts.


Training records must be maintained by the Branch Safety Officer containing the date of the training, a summary of the training session, names and qualifications of the instructors conducting the training, and the names and job titles of the persons attending the training.

Training records must be maintained for a minimum of three (3) years from the date the training was conducted. Training must be conducted by a qualified and competent person knowledgeable in the subject matter. For basic first-aid awareness training by web-based courses, records are automatically generated by the Learning Management System.

5.3.1 General Requirements

In the absence of a clinic or hospital near the workplace, OSHA regulations require that a person or persons be trained to render first-aid and first-aid supplies must be readily available. Although the term “readily available” has not been defined in the regulations, OSHA, through interpretations and legal cases, has indicated that 3-4 minutes is the time frame within which first-aid must be initiated.

OSHA’s interpretation presents a challenge to a service company like ATC because our “workplace” is not always in a fixed location - it is a changing environment that follows the employee wherever they may be working. Accordingly, ATC will use various strategies to provide employees with

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access to first-aid. These may include training ATC personnel to self-administer first-aid; training ATC personnel who are willing to serve as “first responders” and render basic first-aid/CPR to others on a voluntary basis; providing access to trained individuals from other companies who work alongside ATC at job sites (especially construction sites); providing access to client medical clinics; or calling 911 or local emergency phone numbers as indicated in the ATC Health and Safety Plan (HASP).

Because of the potential for exposure to bloodborne pathogens and significant liability concerns, there is no job in the Company that requires an employee to render first-aid or Cardiopulmonary Resuscitation (CPR) in the course and scope of their employment, unless such a requirement becomes necessary due to local, State, or Federal Safety and Health Regulations.


Transportation of injured persons should be by the Supervisor of the injured party where injuries are minor in nature. For more serious injuries, transportation should be by ambulance. If there is any question as to the best method of transportation, an ambulance should be utilized.

When ATC’s strategy for providing access to first-aid/CPR involves the use of “First Responders”, a First Responders Program should be established and administered at the local level. The Branch Safety Officer is responsible for monitoring and maintaining this Program, if implemented.

5.3.2 Basic First-Aid Training

All ATC employees should receive at least minimal instruction in First-Aid, including awareness of Bloodborne Pathogens and the potential effects of exposure. These employees can complete the web-based training courses and ATC Policy documents on First-Aid and Bloodborne Pathogens.

For those personnel who will be working alone at project sites, but typically at sites where first-aid care is made available by the General Contractor, this basic level of first-aid and bloodborne pathogens awareness should be adequate. Where these employees may be cross-trained and work in environments where a higher level of training in First-Aid and CPR may be required, the Branch Manager should include those employees in certification level training.

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5.3.3 Certification Level First-Aid/CPR Training

ATC employees with a higher potential for exposure to injuries requiring immediate first-aid care should receive a higher level of training. In these cases, the project site work may not have first-aid capabilities, and may be remote in nature. In the case of a serious injury, there will be a need for immediate first-aid care for the injured party until qualified assistance (such as an EMT) arrives.


This includes project sites where ATC employees may be exposed to hazards or equipment that could potentially result in life-threatening injuries requiring immediate first-aid/CPR. This includes work involving heavy equipment (such as drill rigs and motorized project equipment), use of hand and portable power tools, electrical work, elevated work with fall potential, and similar activities. For these types of project sites and activities, it is recommended that at least one ATC employee present have the certification level First-Aid/CPR training.

ATC offers certification (hands-on) training through the American Heart Association (AHA) and its nationwide network of qualified trainers. Other providers are acceptable, such as the American Red Cross, as long as the training is comparable. This training, generally four (4) hours in length, covers basic first-aid, Cardiopulmonary Resuscitation (CPR), and includes bloodborne pathogens awareness elements. Refresher training is required to maintain certification.

5.4 First Responder Program

5.4.1 Program Elements

1. The Branch Safety Officer must be trained in certification-level First-Aid & CPR, per Section 5.3.3.
2. The Branch Safety Officer will seek employees who wish to volunteer to be trained and certified in first-aid & CPR. These employees must maintain "current" first-aid and CPR certification (documentation) in their personnel file.
3. First-aid & CPR will be administered by First Responders only to stabilize the employee until professional medical attention can be provided.

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4. Due to the potential occupational exposure to First Responders, it is the responsibility of the Branch Safety Officer or his/her designee to develop and follow an Exposure Control Program, where and to the extent such a program is required by OSHA 29CFR1910.1030 (Bloodborne Pathogens) ATC Policy No. 09. This Program is not required unless first-aid/CPR response is a required part of an employee's job description and function at ATC. However, we will still encourage Voluntary Responders to learn and follow Universal Precautions.

5.4.2 Exposure Control


If an employee is a First Responder or decides to be a "Good Samaritan" and provides first-aid for an injured victim involving blood or bodily fluids, PPE must be used and Universal Precautions followed treating all bodily fluids as infectious.

5.5 First-Aid Stations/First-Aid Kits

A first-aid station or first-aid kit is to be readily available to employees as described previously. For employees working off-premises, a first-aid kit should be provided in each company vehicle, signed-out for use when traveling in personal vehicles and rental vehicles, or provided on the jobsite.

Whether within the facility or in a vehicle, each first-aid kit must be stored in a properly labeled weather-proof container, stocked with the basic supplies specified in the inventory (refer to Appendix 20-03). The physician's approval of the inventory list is not required, but may be needed to address unusual exposure situations.

ATC evaluated various types and sizes of first-aid kits and elected to provide those meeting the American National Standards Institute (ANSI) requirements. Two (2) sizes have been put into an inventory system by Airgas, a national distributor of Swift first-aid kits. Both sizes are similar in contents and have an ATC logo on the case. The case is a durable metal one, with a seal and latching mechanism that provides protection of the contents against moisture and dusts from work environments. The ANSI requirements have contents packaged into color-coded boxes.

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The Branch Safety Officer, or someone he/she may designate, is responsible for checking and maintaining the first-aid kits. Supervisors on jobsites are responsible for assuring suitable supplies are provided in the first-aid kits on-site or in their vehicles. This person will take a weekly inventory of supplies and make sure the station or kit remains adequately stocked. Information on securing first-aid kits, and the basic inventory list for kits, is provided in Appendix 20-03.


5.6 Emergency Eye/Body Wash Stations

Where the eyes and/or body of any employee may be exposed to injurious chemical/corrosive materials, suitable eye and/or body drenching and/or flushing facilities shall be provided whether at an ATC facility or at a temporary worksite. Emergency eye and/or body wash stations can be either of temporary or permanent installation.

In areas where the extent of possible exposure to injurious chemical/corrosive materials is very low, a specially designated pressure controlled and identified water hose can be used when proper personal protective equipment also is used (e.g. full face shield). The hose system must be equipped with a proper face and body wash nozzle and provide copious amounts of low velocity potable water. An appropriate portable eye wash device containing not less than one gallon of potable water, would also be acceptable under these conditions.

At locations where hazardous chemical/corrosive materials are handled by employees (e.g. battery servicing facility), proper eyewash and body drenching equipment must be available. Although OSHA has not adopted specific requirements regarding flow rates for drenching/flushing facilities, ANSI Z358.1 provides detailed information regarding the installation and operation of emergency eyewash and shower equipment, including the requirements for flow rate.

Section 4.1 of ANSI Z358.1 specifies that emergency shower heads shall be capable of delivering a minimum of 20 gallons per minute (gpm) of flushing fluid at a velocity low enough to be non-injurious to the user. A sufficient volume of flushing fluid shall be available to supply the flow rate for a minimum fifteen minute period. As such, both temporary and permanently installed eye/body wash stations must provide at least 20 gpm for 15 minutes.

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Inspection and maintenance of eye wash systems should be provided at least weekly by assuring sanitary conditions and following the manufacturers' requirements for maintenance. Plumbed systems should also be provided a water flow test to minimize contaminants in the line. Inspection and maintenance should be properly documented.

5.7 Bloodborne Pathogens (Universal Precautions)

Employees providing even basic first-aid/CPR response must be aware of the hazards associated with Bloodborne Pathogens and utilize "Universal Precautions" to minimize any potential exposures. Universal Precautions means the first-aid provider will assume that any contact with blood or bodily fluids will expose them to bloodborne pathogens and possibly disease and appropriate precautions, including the use of personal protective equipment (PPE), must be utilized.

For detailed information on Bloodborne Pathogens, Universal Precautions, and employee training, refer to the requirements of OSHA Standard on Bloodborne Pathogens (29CFR 1910.1030) and the ATC Policy (No. 09).

6.0 Appendices

20-01 – Posting – COMP-CARE Injury Assessment Service.

20-02 – Posting – Designated Medical Care Facility.

20-03 – First-Aid Kit Contents.

7.0 References

- Occupational Safety and Health Administration (OSHA), Construction Standards, 29 CFR 1926.50, Medical Services & First-Aid.
- Occupational Safety and Health Administration (OSHA), General Industry Standards, 29 CFR 1910.151, Medical Services & First-Aid.



Injury Assessment Hot-Line:

1-800-756-1130

Call 24 Hours a Day / 7 Days a Week

Effective March 1, 2006, ATC's Injury/Illness Hotline Service will transfer to **COMP•CARE** of Health Resources Corporation, ATC's current National Occupational Health Management Provider. This will replace the current service provided by Medcor.

The new toll-free number is ***1-800-756-1130***.

The service is managed under the direction of ATC's Medical Director, Dr. Jerry Berke. This is an upgrade from our existing service as it not only provides initial triage care, including first-aid instructions and referrals to primary occupational physicians, but it also provides referrals to specialists (when necessary), and follow-up care. Please contact **COMP•CARE** immediately on every work-related injury/illness to ensure prompt, professional, medical attention.

****All new and existing Health and Safety Plans should be modified to reflect the new toll-free number.****

We are in the process of updating our "lifeline" cards and we will distribute new cards reflecting the recent changes. Please contact me if you have any questions.

Thanks,

John

—

John Mollere, CSP
Director of Risk Management
ATC Group Services Inc.
1604 W. Pinhook Rd. Suite 201
Lafayette, LA 70508
337-234-8777 Office
337-235-6777 Fax



Appendix 20-02

DESIGNATED MEDICAL TREATMENT FACILITY

IN CASE OF EMPLOYEE INCIDENT OR INJURY, THE FOLLOWING DESIGNATED MEDICAL TREATMENT FACILITY HAS BEEN IDENTIFIED TO DIRECT THE INJURED EMPLOYEE FOR IMMEDIATE TREATMENT:

NAME OF FACILITY: _____

ADDRESS: _____

TELEPHONE NUMBER: _____

EMERGENCY TELEPHONE NUMBER: _____

HOURS OF OPERATION: _____

SUPERVISOR OR SAFETY OFFICER: _____


SUPERVISOR OR SAFETY OFFICER CELL / PAGER NUMBER: _____

ALL WORK-RELATED INJURIES OR ILLNESSES MUST BE IMMEDIATELY REPORTED TO YOUR SUPERVISOR AND COMP-CARE.

Appendix 20-03

Contents Listing - First-Aid Kits

Large First-Aid Kits		
Item No.	Units	Description
SH4 32-2009S	1	Scissors (4 1/2" Blue Handle)
SH4 32-49319	1	Tweezers (3")
SH4 35-171TB	3	Triangular Bandage (1 each)
SH4 35-100C	1	1" by 3" Plastic Adhesive Bandage (16 each)
SH4 35-103C	1	3/4" by 3" Plastic Adhesive Bandage (16 each)
HEA 40601	1	Wound Cleaner (10 each)
NOS 020135	2	First-Aid Cream (10-1gm pkts.)
SH4 35-187K	1	Burn Gel - Water Soluble (1/8 oz. single use foil pack)
SH4 35-152GB	1	1" by 6 Yds. Gauze Bandages (4 each)
SH 35-144TC	1	4" Bandage Compress (1 each)
158TC	2	4" by 4" Gauze Pads (4 each)
SH4 35-102A	1	Adhesive Tape (2 - 1/2" rolls)
SH4 35-134SW	1	Nox-A-Sting Wipes (10 each)
SH4 35-192EP	1	Eye Pad (4 per pack)
HS4 24-0801C	1	Switeez Eye Lotion (1- 1 oz. pk.; eye drops)
SH4 35-185MK	2	Instant Cold Pack (1 each)
SH4 35-450M	1	CPR Mask (Clear Mouth Barrier)
SH4 35-400G	2	Disposable Gloves (2 prs/pkg.)
SH4 35-500RB	2	Red Biohazard Waste Bags w/Twist-Ties (2/pack)
SH4 35-225AP	1	Aypanal (Non-Aspirin; 325 MG Acetaminiphen)
S55 2988	1	Sunscreen (10-1.5 gm, SPF-30)
SH4 35-510F	1	Face Mask with Eye Shield
Small First-Aid Kits		
Item No.	Units	Description
SH4 35-171TB	1	Triangular Bandage (1 each)
SH4 35-100C	1	1" by 3" Plastic Adhesive Bandage (16 each)
HEA 40601	1	Wound Cleaner (10 each)
SH4 35-187K	1	Burn Gel - Water Soluble (1/8 oz. single use foil pack)
SH 35-144TC	1	4" Bandage Compress (1 each)
158TC	1	4" by 4" Gauze Pads (4 each)
SH4 35-102A	1	Adhesive Tape (2 - 1/2" rolls)
SH4 35-134SW	1	Nox-A-Sting Wipes (10 each)
HS4 24-0801C	1	Switeez Eye Lotion (1- 1 oz. pk.)
SH4 35-185MK	1	Instant Cold Pack (1 each)
SH4 35-450M	1	CPR Mask (Clear Mouth Barrier)
SH4 35-400G	1	Disposable Gloves (2 prs/pkg.)
SH4 35-500RB	1	Red Biohazard Waste Bags w/Twist-Ties (2/pack)
SH4 35-510F	1	Face Mask with Eye Shield
NOTES:		
[1] The above are considered "Standard" contents and minimum number of each unit.		
[2] The eight (8) items in "Bold" text are considered the minimum ANSI requirements for kits.		

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1.0 Policy

Work activities shall be conducted safely with associated fire exposures eliminated and/or controlled through a fire protection and prevention plan.

This policy covers minimum performance standards applicable to all ATC Associates employees and locations. Local practices requiring more detailed or stringent rules, or local, state or other federal requirements regarding this subject can and should be added as an addendum to this procedure as applicable.

2.0 Purpose

To ensure reliable function and availability of site-specific fire protection and prevention systems.

3.0 Scope

Applies to all ATC Associates work sites, i.e., ATC offices, client job sites, etc.

4.0 Definitions

Hot Work means the performing of operations capable of providing a source of ignition, e.g. riveting, welding, cutting, grinding, soldering, burning and heating.

Hot work permit means a specific written plan to do 'hot work'.

Fire watch means employee(s) trained and assigned to monitor or watch for potential fire hazards and initiate response procedures.

5.0 Requirements

5.1 Branch & Worksite Requirements

Each ATC Branch and work site shall develop a written fire protection and prevention plan in concert with the Emergency Preparedness Plan section (13) containing the following elements, as applicable:

- Listing of the major work site fire hazards by location
- Potential ignition sources and means to control them
- Procedures regarding smoking on the site

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- Hot work permitting process for the site (reference Welding section (31) of this manual)
- Explosives (if any) control plan
- List of types and quantity of fire extinguishing equipment on site
- Name and contact phone number of local fire departments
- Statement on whether or not employees will respond to incipient stage fires and use of portable fire extinguishers
- Inspection process for fire extinguishing systems and equipment (reference Appendix 18-1, Form 18-1.1 for a sample fire extinguisher inspection log)
- Employee training plans
- Fire alarm system to be used for the site
- Inspection plan for the site and designating individuals responsible for conducting the inspections

Safety Systems and Health and Safety Plan (HASP) section (7) provides HASP checklists intended to address applicable issues needed in performing the initial assessment. A supplemental checklist for applicable worksite issues to review is found in Appendix 18-1.

5.2 Training

5.2.1 Orientation Training

The new employee orientation shall include specific training on fire prevention requirements of the Branch including:

- potential fire hazards
- fire detection and notification equipment (i.e.—smoke detectors, pull stations, etc.)
- no smoking requirements in offices and warehouses (based on Branch requirements)
- flammable and combustible liquid / gas storage, dispensing and use

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- welding / cutting operations [refer to section (31) of this manual]
- how to properly operate a portable fire extinguisher.

Employees should also be trained on their responsibilities to prevent fires by:

- Separating fuel from ignition sources
- Proper handling and use of flammable liquids and gases
- Following “No Smoking” rules and warnings while maintaining good housekeeping
- Preventing electrical hazards such as arching, damaged cords, overloaded circuits
- Use of applicable hot work permits and fire watches when welding / cutting in areas not designated for that task [refer to “fire watch” in section (31) of this manual]
- Required use of fire watches whenever automatic fire sprinkler protection systems are not functional [refer to “fire watch” in section (31) of this manual]
- notification system for reporting a fire
- use of portable fire extinguishers

A training resource is provided in Appendix 18-2 that can be used to familiarize employees with the general principles of fire prevention, extinguisher use and the hazards involved in incipient stage fire fighting.

5.2.2 Refresher Training

At least annually, a refresher training as described in section (5.2.1) will be provided to all ATC employees.

5.3 Inspection and Maintenance of Fire Suppression Equipment

5.3.1 Portable Fire Extinguishers

Each worksite shall provide a sufficient number of fully operational portable fire extinguishers in strategic locations as required by the authority having local jurisdiction (i.e. – Fire Marshall).

Each portable fire extinguisher shall be provided with a monthly visual

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inspection documented are completed on the facility / worksite inspection checklist, and on an annual basis, inspection / maintenance be completed by a competent individual and/or organization. The annual inspection will include tagging the individual extinguisher noting the date of the last inspection and the competent individual who completed the work.

Items to address during the monthly visual inspection include:

- 1) identify dents or physical damage
- 2) determine if extinguisher(s) are of proper type, is properly located and secured
- 3) confirm annual inspection is current on tag
- 4) verify pin is in place - seal is not broken
- 5) ensure arrow is in GREEN area — showing charge

5.3.1 Automatic Sprinkler Systems

Each worksite provided with automatic fire sprinkler system protection shall inspect and maintain the system as per the requirements of the authority having local jurisdiction (i.e. – Fire Marshall).

It is the responsibility of the Branch Safety Officer to determine if the facility is provided with this type of protection and to establish a preventative maintenance / inspection schedule based on consultation with the authority having local jurisdiction (i.e. – Fire Marshall).

6.0 References

OSHA 29 CFR 1910 Subpart L (Fire Protection)

OSHA 29 CFR 1926 Subpart F (Fire Protection and Prevention)

OSHA 29 CFR 1910.38 (Fire Prevention Plans)

OSHA 29 CFR 1926.24 (Fire Protection and Prevention)



Appendix 18-1
Fire Prevention and Protection Plan Checklist

1. What type of fire alarm system does the facility have or is available to use? How is it activated? Is the fire department notified?
2. How are people in the facility / site made aware of a fire or other emergency?
3. Does the facility have smoke detectors or an automatic sprinkler system? Is it operational?
4. Are all sprinkler shut-off valves identified and accessible? Do designated employees know their location and operation?
5. What flammable / combustible materials are being stored on the premises and where?
6. Are an adequate # and type of fire extinguishers available?, are they inspected both monthly internally and annually by a vendor?, are extra extinguishers needed to perform welding or other hot work operations?
7. Are there people designated for extinguishing fires?
8. Have these people received the necessary training?
9. Describe the housekeeping and storage arrangements?
10. Are there procedures for evacuating employees / guests?
11. Possible ignition sources? List.
12. What phone numbers need to be called in the event of a fire? Are these numbers posted in key areas?

Additional Comments: _____



Appendix 18-2

Fire Safety/Portable Fire Extinguisher Use

Introduction

Most fire fighting efforts should be left to professionals. But, many fires start small and can be safely extinguished with portable fire extinguishers.

The following discusses how fires burn and how you can extinguish them with the appropriate portable fire extinguisher, and most importantly, how to prevent fires from occurring.

The Fire Triangle

Before you attempt to extinguish a fire, it is important to know how a fire works. For a fire to exist, there are three essential components. They are commonly referred to as the Fire Triangle.

- **Fuel** - Paper, wood, oil, solvents and gas are just some examples.
- **Ignition Source / Heat** - The degree necessary to vaporize fuel according to its nature.
- **Oxygen** - Normally at 15% of oxygen in the air is required to sustain a fire. This is present in normal atmospheric conditions.

All three must be present for a fire to exist. If you remove one side of the fire triangle, a fire will be extinguished by cooling (*temperature and heat control*); isolating (*fuel control*); smothering (*oxygen control*); or interrupting the chemical chain reaction in a certain types of fires.

Types of Fires

Fires are classified into four types according to the type of fuel burning.

- **Class A** - Ordinary Combustibles (*ex. wood, paper, cloth or rubbish*)
- **Class B** - Flammable/Combustible Liquids (*ex. gasoline, solvents, oil, paint or grease*)
- **Class C** - Electrical Fires (*ex. any item that is burning and electrically energized*)
- **Class D** - Combustible Metals (*i.e., magnesium, titanium, powdered aluminum, sodium, potassium and zinc*)

Types of Extinguishing Agents and Fire Extinguishers

There are four types of portable fire extinguishers used to extinguish fires. There are also four different extinguishing agents that are used depending on the type of fire.

Types of extinguishing agents:

- **Dry Chemical** - It is a powder used to coat the fire and smother it.
- **Water** - It is used to cool the fire. *Water should never be used on electrical fires (Class C). Water acts as a conductor for electricity. Water should never be used on a Class B fire, it can cause the fire to splatter and spread.*



- **Carbon Dioxide** - It is used to cool the fire and displaces oxygen. (*Care should be used when using in confined spaces, as it displaces oxygen.*)
- **Foam** - It is a mixture of water and a foaming solution that smothers and cools a fire. (*Foam contains water and should not be used on electrical fires.*)

Types of Fire Extinguishers:

Fire extinguishers are classified the same way the types of fire are classified. The following are the fire extinguisher classifications and the types of extinguishing agents they use.

- **Class A** - Water, dry chemical, foam or carbon dioxide can be used to extinguish ordinary combustibles. Dry chemical powder is the most common.
- **Class B** - Dry chemical, carbon dioxide or foam can be used to extinguish flammable liquids. Dry chemical powder is the most common and very effective extinguishing agent.
- **Class C** - Dry chemical or carbon dioxide can be used. Once the energy source is removed, water or foam may be used depending on the fuel burning.
- **Class D** - A special powder used for combustible metals.

Inspection, Maintenance, and Testing of Fire Extinguishers

Fire extinguishers should be visually inspected monthly. The following items should be noted during the monthly inspection:

- Is the fire extinguisher charged? Check the gauge.
- Is the cylinder free from obvious damage such as dents, rust, or other defects?
- Is the hose free from damage such as cuts, clogged or other defects?
- Is the fire extinguisher mounted in the appropriate area?

If any defects are noted, the fire extinguisher should be repaired / serviced by a qualified service person.

Fire extinguishers should also be inspected annually by a qualified inspector. This may include, but not limited to hydrostatic testing the cylinder. The fire extinguisher should be tagged with the date of the last inspection.

Choosing the Right Fire Extinguisher

Selecting the proper fire extinguisher is key to extinguishing a fire promptly and safely. First, you need to know where the fire extinguishers are located. Fire extinguishers should be securely mounted, visible and easily accessible.

The first step is to determine what type of fuel is burning. Remember, different extinguishers are used for different types of fires. The fire extinguisher should be appropriate for the area that it is located, but you should never assume it is correct. The location of the fire can help you make the right selection.

Once you have determined the type of fuel burning, you need to know how to select the correct fire extinguisher. All fire extinguishers must be labeled.

They will have the letters **A, B, C** or **D** or a fire extinguisher may also be labeled with a combination of letters (*i.e.*, **AB** or **ABC**). These are multi-purpose fire extinguishers used for a variety of different type fires. ABC is the type that is commonly used at the majority of our offices and project sites.

How to Use the Fire Extinguisher

Now that the selection has been addressed, it is time to put the fire out. It is important that you follow proper procedures. If used improperly, a fire extinguisher can spread a fire and endanger lives.

Here are the basic steps for operation:

- Pull the Pin.
- Test Fire the extinguisher by momentarily depressing the trigger. (*It is important to know that*

the fire extinguisher will work before you attack the fire.)

- Aim the hose at the base of the fire.



- Squeeze the trigger
- Sweep the stream back and forth, while approaching the fire slowly, until the fire is extinguished.

Before you should attempt to extinguish a fire, follow the following steps in order:

1. **ALWAYS** notify others to call the Fire Department.
2. If you are alone, you should call the Fire Department first.
3. Identify a means to escape the fire if you are unable to extinguish it or it becomes too large.

Fire Prevention

Each of us can minimize the potential of accidental fire occurring or spreading by following these simple tips:

- ***Do not use any equipment which is not working properly!*** Report frayed wiring, loose electrical connections, and any malfunctioning equipment immediately to your Supervisor.
- Regularly clean any cooking appliances to avoid grease build-up.
- Never overload electrical circuits, use surge protection whenever possible, and maintain at least 36" clearance for electrical breaker boxes.
- Store combustible/flammable storage or debris (cleaners, paper, etc.) away from heat sources.
- Take special care when lighting gas appliances such as water heaters or furnaces.
- Always turn off all heat-producing equipment when not in use and when leaving for the day. If you are in doubt, ***check it again to make sure it is off.***
- Ensure smoking policies are communicated and enforced as these are often regulated by State or local ordinances. In designated smoking areas, ensure that good housekeeping is maintained and smoking materials are fully extinguished after use.

Remember, your safety is the first priority.

Fire Safety / Fire Extinguisher Quiz

- | | | | |
|-----|------|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. | True | False | The Fire Triangle refers to the three components required to create fire including - Fuel, Heat and/or Ignition Source, and Water. |
| 2. | True | False | The dry chemical extinguishing agent puts out a fire by smothering it. |
| 3. | True | False | Class A fire extinguishers should be used to extinguish a gasoline fire. |
| 4. | True | False | Portable fire extinguishers should always be securely mounted and easily accessible. |
| 5. | True | False | No matter how large a fire is, you should always attempt to extinguish it. |
| 6. | True | False | You should always try to attempt to extinguish the fire before calling for help. |
| 7. | True | False | There are three classifications of fire extinguishers: A, B and C. |
| 8. | True | False | Wood is considered a Class B fire. |
| 9. | True | False | If you are notified to exit the building due to fire, you should make sure to cleanup the work area before leaving the building. |
| 10. | True | False | When using a fire extinguisher, the nozzle on the fire extinguisher should be pointed at the base of the fire and you should sweep the stream back and forth until the fire is completely extinguished. |
| 11. | True | False | When notified to evacuate the building due to fire, all employees are required to exit the building and gather at the designated assembly area. |

Acknowledgment of Training

Employees Name Printed

Date

Employees Signature



Appendix 18-1
Fire Prevention and Protection Plan Checklist

1. What type of fire alarm system does the facility have or is available to use? How is it activated? Is the fire department notified?
2. How are people in the facility / site made aware of a fire or other emergency?
3. Does the facility have smoke detectors or an automatic sprinkler system? Is it operational?
4. Are all sprinkler shut-off valves identified and accessible? Do designated employees know their location and operation?
5. What flammable / combustible materials are being stored on the premises and where?
6. Are an adequate # and type of fire extinguishers available?, are they inspected both monthly internally and annually by a vendor?, are extra extinguishers needed to perform welding or other hot work operations?
7. Are there people designated for extinguishing fires?
8. Have these people received the necessary training?
9. Describe the housekeeping and storage arrangements?
10. Are there procedures for evacuating employees / guests?
11. Possible ignition sources? List.
12. What phone numbers need to be called in the event of a fire? Are these numbers posted in key areas?

Additional Comments: _____



Appendix 18-2

Fire Safety/Portable Fire Extinguisher Use

Introduction

Most fire fighting efforts should be left to professionals. But, many fires start small and can be safely extinguished with portable fire extinguishers.

The following discusses how fires burn and how you can extinguish them with the appropriate portable fire extinguisher, and most importantly, how to prevent fires from occurring.

The Fire Triangle

Before you attempt to extinguish a fire, it is important to know how a fire works. For a fire to exist, there are three essential components. They are commonly referred to as the Fire Triangle.

- **Fuel** - Paper, wood, oil, solvents and gas are just some examples.
- **Ignition Source / Heat** - The degree necessary to vaporize fuel according to its nature.
- **Oxygen** - Normally at 15% of oxygen in the air is required to sustain a fire. This is present in normal atmospheric conditions.

All three must be present for a fire to exist. If you remove one side of the fire triangle, a fire will be extinguished by cooling (*temperature and heat control*); isolating (*fuel control*); smothering (*oxygen control*); or interrupting the chemical chain reaction in a certain types of fires.

Types of Fires

Fires are classified into four types according to the type of fuel burning.

- **Class A** - Ordinary Combustibles (*ex. wood, paper, cloth or rubbish*)
- **Class B** - Flammable/Combustible Liquids (*ex. gasoline, solvents, oil, paint or grease*)
- **Class C** - Electrical Fires (*ex. any item that is burning and electrically energized*)
- **Class D** - Combustible Metals (*i.e., magnesium, titanium, powdered aluminum, sodium, potassium and zinc*)

Types of Extinguishing Agents and Fire Extinguishers

There are four types of portable fire extinguishers used to extinguish fires. There are also four different extinguishing agents that are used depending on the type of fire.

Types of extinguishing agents:

- **Dry Chemical** - It is a powder used to coat the fire and smother it.
- **Water** - It is used to cool the fire. *Water should never be used on electrical fires (Class C). Water acts as a conductor for electricity. Water should never be used on a Class B fire, it can cause the fire to splatter and spread.*



- **Carbon Dioxide** - It is used to cool the fire and displaces oxygen. (*Care should be used when using in confined spaces, as it displaces oxygen.*)
- **Foam** - It is a mixture of water and a foaming solution that smothers and cools a fire. (*Foam contains water and should not be used on electrical fires.*)

Types of Fire Extinguishers:

Fire extinguishers are classified the same way the types of fire are classified. The following are the fire extinguisher classifications and the types of extinguishing agents they use.

- **Class A** - Water, dry chemical, foam or carbon dioxide can be used to extinguish ordinary combustibles. Dry chemical powder is the most common.
- **Class B** - Dry chemical, carbon dioxide or foam can be used to extinguish flammable liquids. Dry chemical powder is the most common and very effective extinguishing agent.
- **Class C** - Dry chemical or carbon dioxide can be used. Once the energy source is removed, water or foam may be used depending on the fuel burning.
- **Class D** - A special powder used for combustible metals.

Inspection, Maintenance, and Testing of Fire Extinguishers

Fire extinguishers should be visually inspected monthly. The following items should be noted during the monthly inspection:

- Is the fire extinguisher charged? Check the gauge.
- Is the cylinder free from obvious damage such as dents, rust, or other defects?
- Is the hose free from damage such as cuts, clogged or other defects?
- Is the fire extinguisher mounted in the appropriate area?

If any defects are noted, the fire extinguisher should be repaired / serviced by a qualified service person.

Fire extinguishers should also be inspected annually by a qualified inspector. This may include, but not limited to hydrostatic testing the cylinder. The fire extinguisher should be tagged with the date of the last inspection.

Choosing the Right Fire Extinguisher

Selecting the proper fire extinguisher is key to extinguishing a fire promptly and safely. First, you need to know where the fire extinguishers are located. Fire extinguishers should be securely mounted, visible and easily accessible.

The first step is to determine what type of fuel is burning. Remember, different extinguishers are used for different types of fires. The fire extinguisher should be appropriate for the area that it is located, but you should never assume it is correct. The location of the fire can help you make the right selection.

Once you have determined the type of fuel burning, you need to know how to select the correct fire extinguisher. All fire extinguishers must be labeled.

They will have the letters **A, B, C** or **D** or a fire extinguisher may also be labeled with a combination of letters (*i.e.*, **AB** or **ABC**). These are multi-purpose fire extinguishers used for a variety of different type fires. ABC is the type that is commonly used at the majority of our offices and project sites.

How to Use the Fire Extinguisher

Now that the selection has been addressed, it is time to put the fire out. It is important that you follow proper procedures. If used improperly, a fire extinguisher can spread a fire and endanger lives.

Here are the basic steps for operation:

- Pull the Pin.
- Test Fire the extinguisher by momentarily depressing the trigger. (*It is important to know that*

the fire extinguisher will work before you attack the fire.)

- Aim the hose at the base of the fire.



- Squeeze the trigger
- Sweep the stream back and forth, while approaching the fire slowly, until the fire is extinguished.

Before you should attempt to extinguish a fire, follow the following steps in order:

1. **ALWAYS** notify others to call the Fire Department.
2. If you are alone, you should call the Fire Department first.
3. Identify a means to escape the fire if you are unable to extinguish it or it becomes too large.

Fire Prevention

Each of us can minimize the potential of accidental fire occurring or spreading by following these simple tips:

- ***Do not use any equipment which is not working properly!*** Report frayed wiring, loose electrical connections, and any malfunctioning equipment immediately to your Supervisor.
- Regularly clean any cooking appliances to avoid grease build-up.
- Never overload electrical circuits, use surge protection whenever possible, and maintain at least 36" clearance for electrical breaker boxes.
- Store combustible/flammable storage or debris (cleaners, paper, etc.) away from heat sources.
- Take special care when lighting gas appliances such as water heaters or furnaces.
- Always turn off all heat-producing equipment when not in use and when leaving for the day. If you are in doubt, ***check it again to make sure it is off.***
- Ensure smoking policies are communicated and enforced as these are often regulated by State or local ordinances. In designated smoking areas, ensure that good housekeeping is maintained and smoking materials are fully extinguished after use.

Remember, your safety is the first priority.

Fire Safety / Fire Extinguisher Quiz


- | | | | |
|-----|------|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. | True | False | The Fire Triangle refers to the three components required to create fire including - Fuel, Heat and/or Ignition Source, and Water. |
| 2. | True | False | The dry chemical extinguishing agent puts out a fire by smothering it. |
| 3. | True | False | Class A fire extinguishers should be used to extinguish a gasoline fire. |
| 4. | True | False | Portable fire extinguishers should always be securely mounted and easily accessible. |
| 5. | True | False | No matter how large a fire is, you should always attempt to extinguish it. |
| 6. | True | False | You should always try to attempt to extinguish the fire before calling for help. |
| 7. | True | False | There are three classifications of fire extinguishers: A, B and C. |
| 8. | True | False | Wood is considered a Class B fire. |
| 9. | True | False | If you are notified to exit the building due to fire, you should make sure to cleanup the work area before leaving the building. |
| 10. | True | False | When using a fire extinguisher, the nozzle on the fire extinguisher should be pointed at the base of the fire and you should sweep the stream back and forth until the fire is completely extinguished. |
| 11. | True | False | When notified to evacuate the building due to fire, all employees are required to exit the building and gather at the designated assembly area. |

Acknowledgment of Training

Employees Name Printed

Date

Employees Signature

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1.0 Policy

Work activities where employees may be subject to falls and/or falling objects shall be conducted safely with associated hazards eliminated and/or controlled.

This policy covers minimum performance standards applicable to all ATC Associates employees and locations. Local practices requiring more detailed or stringent rules, or local, state or other federal requirements regarding this subject can and should be added as an addendum to this procedure as applicable.

2.0 Purpose

To ensure that employees are protected from the hazards associated falls and falling objects.

3.0 Scope

Applies to all ATC Associates work sites, i.e., ATC offices, client job sites, etc., where field construction related activities involve exposure to heights greater than or equal to six (6) feet and/or falling objects exist. In general industry (e.g. offices, shops, warehouses, etc.) exposure to heights greater than or equal to four (4) feet shall be in place of all references to the construction six (6) foot reference.

4.0 Definitions


Anchorage means a secure point of attachment for lifelines, lanyards, or deceleration devices that is capable of supporting 5,000 lbs. per employee or two times the intended impact load, whichever is greater, or for a positioning system, 3,000 lbs. without failure.

Aerial Personnel Lifts (reference section (8) of this manual)

Approved means, for the purpose of this section, authorized by the Branch Safety Officer, tested and certified by the manufacturer or any recognized national testing laboratory to possess the strength requirements specified in this section.

Catenary Line – see **Horizontal Lifeline**.

Competent Person means an individual knowledgeable (through experience and/or training) of fall protection equipment, including the manufacturer's recommendations and instructions for the proper use, inspection, and maintenance; who is capable of identifying existing and potential fall hazards; who has the authority to take prompt corrective action to eliminate those hazards; and who is knowledgeable of the rules contained in this section regarding the erection, use, inspection, and maintenance of fall protection equipment and systems.

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Controlled Access Zone means an area in which certain work may take place without the use of guardrail systems, personal fall arrest systems, or safety net systems and access to the zone is controlled.

Deceleration Device means a device manufactured (fall) shock-absorbing device whereby the forces of the fall are rapidly reduced to meet acceptable levels.

Drop Line means a vertical lifeline secured to an upper anchorage for the purpose of attaching a lanyard or device.

Employee means every laborer regardless of title or contractual relationship.

Fall Arrest System (Personal) means the use of multiple, approved safety equipment components such as body harnesses, shock absorbing lanyards, deceleration devices, droplines, horizontal and/or vertical lifelines and anchorages, interconnected and rigged to ones body as to arrest a free fall.

Fall Protection Work Plan means a written planning document in which the employer identifies areas in the work area where a fall hazard of 6 feet or greater exists, whereby conventional Fall Restraint and Fall Arrest Systems cannot be utilized.

Fall Restraint System means an approved device and any necessary components that function together to restrain an employee in such a manner as to prevent that employee from falling to a lower level.

Fall Distance means the actual distance from the employee's work platform (area) to the level where a fall would stop (ground level or otherwise).


Full Body Harness means a configuration of connection straps to distribute a fall arresting force over at least the thighs, shoulders and pelvis, with provisions for attaching a lanyard, lifeline, positioning rings, or deceleration devices.

Full Body Harness System means a Class III full body harness and shock absorbing lanyard attached to an anchorage or attached to a horizontal or vertical lifeline which is properly secured to an anchorage(s) capable of withstanding the forces specified in the applicable sections.

Hardware means snap hooks, D-rings, buckles, carabiniers, and adjusters used to attach the components of a fall protection system together.

Holes (floor, roof or walking surface) means any opening in the floor greater than two inches whereby falling objects or an employee fall equal to, or greater than six foot is possible.

Holes (wall) – see **Wall Opening**.

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Horizontal Lifeline means an approved rail, rope, or synthetic cable installed in a horizontal plane between two anchorages and used for attachment of a employee's lanyard or lifeline device while moving horizontally.

Lanyard means a flexible line of webbing, rope or cable (usually in two, four or six foot lengths) used to secure a harness to a lifeline or an anchorage point.

Leading Edge means the advancing edge of a floor or roof, where a fall of more than six foot is possible to the ground or to another level.

Lifeline (vertical or horizontal) means an approved vertical line from a fixed overhead anchorage or horizontal line between two horizontal anchorages, independent of walking or working surfaces, to which a lanyard or device is secured.

Restraint Line means a line from a fixed anchorage or between two anchorages to which an employee is secured in such a way as to restrict the employee from reaching a point where falling to a lower level is possible.

Safety Line – see **Lifeline**.

Shock Absorbing Lanyard means a flexible line of webbing or rope used to secure a harness to a lifeline or anchorage point that has an integral shock absorber of either a rip-stitch or retractable configuration.

Snaphook – means a 'locking' hook at the end of a lanyard or restraining/positioning line that has a double-action locking mechanism intended to eliminate unintentional unhooking from the D-ring of a body harness. Non-locking snaphooks are prohibited.


Standard Guardrail means a toprail at 42 inches high (plus or minus three inches), a midrail installed midway the top edge of the guardrail system and the surface.

Static Line – see **Lifeline**.

Toeboard means a barrier at the base of the guardrail system to prevent material and objects from falling off the surface. They are at least four (4) inches of nominal height with no less than one (1) inch clearance from the surface.

Unprotected Sides and Edges means any side or edge (except at entrances to points of access) of a floor, roof, ramp, or runway where there is no wall or guardrail system.

Walking/Working Surface means for the purpose of this section, any area whose dimensions are 45 inches or greater in all directions through which employees pass or conduct work, and can include scaffolding and aerial lifts regardless of surface dimensions.

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Wall Opening means a gap in a wall where the outside bottom edge is 6 feet or more above lower levels, and the inside bottom edge (e.g. parapit wall) is less than 39 inches above the walking/working surface.


Work Area means that portion of a walking/working surface where work activities are being performed.

5.0 Requirements

5.1 Training

Fall Protection training requirements shall include:

- New employees with work responsibilities requiring the use of fall protection will be oriented to the ATC Associates Fall Protection Program (and any local addendums) as part of the 'new employee orientation program'.
- At new worksites, i.e., ATC offices, client job sites, etc., during the pre-job meeting to describe specific fall protection requirements of the job.
- Thereafter, every foreseeably exposed employee will be trained at least annually, and include the following:
 - The nature of fall hazards in the typical work area
 - The correct procedures for erecting, maintaining, disassembling, and inspecting fall protection systems
 - The use and operation of conventional and non-conventional fall protection systems
 - The role of each employee in the safety monitoring system when such a system is in use
 - The limitations on the use of mechanical equipment during the performance of roof work on low-slope roofs
 - The correct procedures for equipment and materials handling and storage, and the erection of overhead protection
 - The correct fit, maintenance and use of (personal) fall arrest system components, as determined by the manufacturer(s)
 - Rescue procedures in the event an individual falls
 - All other details in this section (and local addendums)

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Toolbox talks for related issues of this manual section shall be covered periodically.

Retraining shall also occur whenever deficiencies in the training program are identified, standard requirements change or are modified or new fall protection systems are introduced.

Any employee who has not received orientation or annual training (as previously outlined) shall not be allowed to work at heights identified by this section.

Training provided shall be documented and maintained in a training file at the Branch Office. Training will include dates of training, instructor's name, topics / material covered and attendee names.

5.2 Conventional Fall Arrest and Fall Restraints Systems shall be utilized where the exposure to falls greater than 6 foot and from falling objects as is reasonably foreseen. The following systems shall be utilized:

5.2.1 Guardrail System (fall restraint and potentially from falling objects)


Toprails and midrails of guardrail systems constructed of wood shall be at least ¼ inch diameter or thickness to prevent cuts and lacerations.

If wire rope is used for toprails, it shall be flagged at not more 6 feet intervals with high-visibility material. Steel and plastic banding are prohibited for use as toprails or midrails.

The top edge height of toprails, or (equivalent) guardrails shall be 42 inches, plus or minus 3 inches, above the walking/working level.

When employees are using ladders in distance proximity equivalent to the maximum use-length of the ladder, the top edge height of the top rail, or equivalent member, shall be increased an amount equal to the maximum use-length height of the ladder, **or see Special Control Procedures** (5.4.5) portion (for ladders) of this manual section for other options.

Screens, midrails, mesh, intermediate vertical members, or equivalent intermediate structural members shall be installed between the top edge of the guardrail system and the walking/working surface when there are no walls or parapet walls at least 21 inches high. When midrails are used, they shall be installed at a height midway between the top edge of the guardrail

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system and the walking/working level. When screens and mesh are used, they shall extend from the top rail to the walking/working level. Intermediate members, such as balusters, when used between posts, will not be more than 19 inches apart.

The guardrail system shall be capable of withstanding a force of at least 200 pounds of force applied within 2 inches of the top edge in any outward or downward direction. When the 200 pounds is applied in a down-ward direction, the top edge of the guardrail shall not deflect to a height less than 39 inches above the walking/working level.

Midrails, screens, mesh, intermediate vertical members, solid panels, and equivalent structural members will be capable of withstanding a force of at least 150 pounds of force applied in any downward or outward direction at any point along the midrail or other member.

Guardrail systems shall be free of sharp edges and burrs to protect against punctures or lacerations and to prevent clothing from snagging.


The ends of top rails and midrails shall not overhang terminal posts, except where such an overhang does not constitute a projection hazard.

When guardrail systems are used at hoisting areas, a chain, gate or removable guardrail section shall be placed across the access opening between guardrail sections when hoisting operations are not taking place.

At uncovered holes, guardrail systems shall be set up on unprotected sides or edges. When holes are used for the passage of materials, the hole shall have not more than two sides with removable guardrail sections. When the hole is not in use, it shall be covered or provided with guardrails along unprotected sides/edges.

If guardrail systems are used around uncovered holes that are used as access points (such as ladderways), gates shall be used or the guardrail shall be offset at a 45 degree angle to prevent accidental walking into the hole. Toeboards shall be utilized around the edges not utilized as the actual access point.

If guardrails are used at unprotected sides or edges of ramps and runways, they shall be erected on each unprotected side/edge.

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When guardrail systems, in combination with netting, is used to prevent materials from falling from one level to another, openings shall be small enough to prevent passage of potential falling objects.

5.2.2 Covers for Holes (fall restraint and from falling objects)

Covers (or a guardrail system with toe boards...see Guardrail Systems within this section) shall be installed over holes equal to or greater than 2" in floors, roofs and walkways that are more than 6 feet above lower levels.

Hole covering material shall support at least two times the potential weight that will cross over it. If plywood is chosen as the cover material, it shall be of at least ¾ inch in thickness.

Hole covers shall be secured in place in such a manner as to not easily be displaced. Examples of securing methods include, but are not limited to: nailing, attached cleats, wire, etc.

Such covers shall have the word 'HOLE' or 'COVER' predominately marked on the top surface. Where covers are too small for such marking, they shall be painted or significantly marked in the color orange.

5.2.3 Restraining/Positioning System (fall restraint)

Only full body harness systems with positioning rings are to be utilized with any restraining/positioning system.

Restraint line (rope) length shall not exceed the distance to fall exposure, and shall be secured to an anchorage capable of supporting at least twice the potential impact load of an employee's fall or 3,000 pounds, whichever is greater.


Requirements for body harness systems, snaphooks, D-rings, and other connectors used with positioning device systems shall meet the same criteria as those for fall arrest systems (5.2.4) of this section.

No makeshift fall protection equipment may be utilized.

Body belts are prohibited.

5.2.4 (Personal) Fall Arrest System (fall arrest)

(Personal) Fall Arrest Systems shall do all of the following:

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- Limit maximum arresting force on an employee to 1,800 pounds. Note: total body weight including tools cannot exceed 310 lbs. to stay under arresting force limit
- Be rigged so that an employee can neither free fall more than 6 feet nor contact any lower level
- Bring an employee to a complete stop and limit maximum deceleration distance an employee travels to 3.5 feet
- Have sufficient strength to withstand 5000 lbs. (excluding horizontal lifelines which require a safety factor of at least two times the potential impact energy)
- All components of the (personal) fall arrest system (lanyards, body harness and attached hardware, and shock-absorbing devices) shall meet the design specifications of OSHA 1926.502 Subpart M


The following items/actions are prohibited for use with (personal) fall arrest systems:

- body belts
- non-locking snaphooks
- lanyards without shock absorbers
- tying back to the lanyard (once around another object) for a means of an anchorage point, unless the lanyard was designed for this purpose by the manufacturer, the object tied around can support the anticipated fall force and the object does not have sharp edges or burrs

5.2.5 (Personal) fall arrest systems shall be utilized in the following manner:

5.2.5.1 Pre-Use Inspection

All components shall be inspected prior to each use for wear damage, and other deterioration in accordance with manufacturer's requirements (see equipment inspection and maintenance procedures of this section).

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5.2.5.2 General Proper Body Harness Fit Guidelines (two employees are usually required to completely fit each other)

The body harness type and size shall meet the physical needs of its user (male/female or small, medium, large, etc.).

Follow the manufacturer's guidelines on proper fit.

Shoulder, thigh, button and chest straps shall be fit snugly whereas it is slightly difficult to slide the hand underneath.

Loose straps ends shall be folded back under.

D-ring placement should be between the shoulder-blades.

Chest straps should be positioned across the mid-chest area.


5.2.5.3 Sufficient Anchorage Points Utilized

Anchorage shall be used under the supervision of a competent person, as part of a complete (personal) fall arrest system that maintains a safety factor of at least two (i.e., capable of supporting at least twice the weight expected to be imposed upon it).

Anchorage used to attach (personal) fall arrest systems will be independent of any anchorage being used to support or suspend platforms and shall be capable of supporting at least 5,000 pounds of force per person attached.

Anchorage points can include:

- Lifelines (horizontal and vertical)
- Designed anchorage points on aerial lifts
- Eye-bolts listed for use by the manufacturer
- Specially designed anchorage tools specifically designed to meet fall force requirements, including:
- Wrap-around lanyards as approved by the manufacturer
- I-beam clamps designed specifically as an anchorage point

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Prohibited anchorage points include, but are not limited to:

- Standard guardrails and railing
- Ladders/rungs
- Scaffolding, unless approved by the manufacturer for/with anchorage points
- Light fixtures, ductwork, conduit, pipe vents, wiring/duct/piping harnesses, other roof stacks, vents or fans
- C-clamps
- Piping (unless capable of meeting the criteria of an anchorage point)
- To a lanyard (around a solid object), unless the lanyard and hardware is manufactured for that purpose

5.2.5.4 Lifeline/Lanyard Applications


Lanyards shall only be attached to anchorage points sufficient to meet the fall force requirements.

Shock-absorbing lanyards are required to limit the fall force to less than 1800 pounds.

Self-retracting lanyards (retractables) capable of withstanding the tensile load of 3,000 lbs. that limit the free fall distance to two (2) feet or less are always recommended and **are required when the fall distance is less than nineteen and one-half (19.5) feet.**

Lanyards that do not limit free fall distance to 2 feet or less, such as ripstitch lanyards and tearing/deforming lanyards will be capable of sustaining a minimum tensile load of 5,000 pounds applied to the device with the lifeline or lanyard in the fully extended position.

Horizontal lifelines will be designed, installed, and used under the supervision of a Competent Person, as part of a complete (personal) fall arrest system. Lifelines shall be protected against being cut or abraded. Horizontal lifelines cannot exceed sixty feet in length.

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Vertical lifelines shall be utilized with leading edge work, shall reach the ground, and the method of anchorage attachment shall be of proper design (i.e. no knots).

5.2.6 Safety Net System (fall arrest and potentially from falling objects)

When utilized, safety nets shall be installed as close as practicable under the walking/working surface on which employees are working and never more than 30 feet below such levels.

Safety nets will be inspected at least once a week for wear, damage, and other deterioration. The maximum size of each safety net mesh opening will not exceed 36 square inches nor be longer than 6 inches on any side, and the openings, measured center-to-center, of mesh ropes or webbing, will not exceed 6 inches.


Defective/unfit nets are not to be used and are to be taken from service and immediately destroyed by cutting into useless sizes and properly disposed.

Mesh crossings will be secured to prevent enlargement of the mesh opening. Each safety net or section will have a border rope for webbing with a minimum breaking strength of 5,000 pounds. Connections between safety net panels will be as strong as integral net components and be spaced no more than 6 inches apart.

Safety nets shall extend outward from the outermost projection of the work surface as follows:

Vertical distance from working level to horizontal plane of net surface.	Minimum required horizontal distance of outer edge of net from edge of working surface.
Up to 5 feet	8 feet
More than 5 feet up to 10 feet	10 feet
More than 10 feet	13 feet

Safety nets shall be tested at the beginning of each workday and shall be capable of absorbing an impact force of a drop test consisting of a 400-pound bag of sand 30 inches in diameter dropped from the highest walking/working surface at which workers

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are exposed, but not from less than 42 inches above that level. Employees shall not be allowed in work areas controlled with safety nets until this test is complete.

If safety nets are utilized for the dual purpose of employee fall protection and the protection of other workers from fall objects, the net webbing opening shall be small enough to prevent passage of potential falling objects.

Items that have fallen into safety nets, such as materials, scrap, equipment, and tools, shall be removed as soon as possible and at least before the next work shift.


5.3 Where conventional fall restraint and fall arrest methods cannot be utilized (or utilized safely), the following non-conventional methods can be utilized

A written work plan shall be developed when a project or task possesses a fall exposure whereby these systems are utilized. A sample written plan format can be found in 29 CFR 1926 Subpart M Appendix E.

A Competent Person will develop and implement a written Fall Protection Work Plan including each area of the work place where the employees are assigned and where fall hazards of 6 feet or more will exist. The Risk Assessment for this project/task should be reviewed for this document.

The written Fall Protection Work Plan shall include:

- Identification of fall hazards in the work area
- Describe the non-conventional method (or in combination with conventional method) of fall protection to be provided
- Describe the correct procedures for the assembly, maintenance, inspection, and disassembly of any fall protection system to be used
- Describe the correct procedures for the handling, storage, and securing of tools and materials
- Describe the method of providing overhead protection for workers who may be in or pass through the area below the work site
- Describe the method for prompt, safe removal of injured workers
- Describe the method for destruction of personal fall arrest system equipment subjected to the forces of any fall

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- Be available at all times on the jobsite

5.3.1 Controlled Access Zone System


Controlled access zone systems shall be set up as follows:

- Zone shall be established no closer than six (6) feet or further than twenty-five (25) feet from any leading edge
- Control line shall extend parallel along the entire length of the unprotected or leading edge
- Only trained employees are allowed in the Zone
- The Zone shall have signage marking it as a 'Controlled Access Zone'

5.3.2 Warning Line System (pitches of $\leq 4:12$ and flat surfaces only)

Warning line systems consist of ropes, wires, or chains, and supporting stanchions and are set up as follows:

- Flagged at not more than 6-foot intervals with high-visibility material
- Rigged and supported so that the lowest point including sag is no less than 34 inches from the walking/working surface and its highest point is no more than 39 inches from the walking/working surface
- Stanchions, after being rigged with warning lines, will be capable of resisting, without tipping over, a force of at least 16 pounds applied horizontally against the stanchion, 30 inches above the walking/working surface, perpendicular to the warning line and in the direction of the floor, roof, or platform edge
- The rope, wire, or chain will have a minimum tensile strength of 500 pounds, and after being attached to the stanchions, shall support without breaking the load applied to the stanchions as prescribed above
- Line will be attached to each stanchion in such a way that pulling on one section of the line between stanchions will not result in slack being taken up in the adjacent section before the stanchion tips over
- Warning lines will be erected around all sides of roof work areas. When mechanical equipment is being used, the warning line will be erected not less than 6 feet from the roof edge parallel to the direction

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of mechanical equipment operation, and not less than 10 feet from the roof edge perpendicular to the direction of mechanical equipment operation

When mechanical equipment is not being used, the warning line shall be erected not less than 6 feet from the roof edge.

The warning line system shall be used in conjunction with one of the following:

- safety monitoring system (most common); or
- (personal) fall arrest system; or
- safety net system; or
- guardrails

5.3.3 Safety Monitoring System


A competent person will appoint the 'safety monitor' and will ensure that the safety monitor:

- Is competent in the recognition of fall hazards
- Is capable of warning workers of fall hazard dangers and in detecting unsafe work practices
- Is operating on the same walking/working surfaces of the employees and can see them
- Is close enough to work operations to communicate orally with the employees and has no other duties but the monitoring function
- Has the authority to stop work

Only employees engaged in roof/surface work and the safety monitor shall be allowed in an area where an employee is being protected by a safety monitoring system.

5.4 Specific Fall Hazard Procedures

5.4.1 Aerial Personnel Lifts

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Employees utilizing aerial personnel lifts (e.g. scissor lifts, genie lifts, cherry-pickers, boom-lifts, etc.) shall use a restraint/positioning system or (personal) fall arrest system, even though a guardrail system is in place. Refer to Aerial Personnel Lifts section (8) for specific information on operating this equipment.

Attachment points for these systems shall be capable of withstanding 5,000 pounds and shall be maintained in the floor of the lift or where designed by the manufacturer.

Rails of such lifts shall not to be used as attachment points unless designed for that purpose by the manufacturer.

5.4.2 Excavations

Employees who work at the edge of an excavation 6 feet or more deep will be protected from falling into the excavation by guardrail systems or covers. Refer to Excavation & Trenching section (16) for specific information.

Where walk-ways are provided to permit employees to cross over excavations, guardrails are required on the walkway if the fall would be 6 feet or more to the lower level.

5.4.3 Hoist Areas


Each employee in a hoist area will be protected from falling 6 feet or more by guardrail, restraint/positioning or (personal) fall arrest systems. Refer to Equipment section (15) for specific information on utilizing this equipment.

If guardrail systems (or chain gate or guardrail), or portions thereof, must be removed to facilitate hoisting operations, as during the landing of materials, and a worker shall lean through the access opening or out over the edge of the access opening to receive or guide equipment and materials, that employee shall be protected by a (personal) fall arrest system.

5.4.4 Falling Objects (additional protection from)

Except for scaffolding and aerial lifts, no materials or equipment shall be stored within 6 feet of working edges.

When **canopies** are used as protection from falling objects, canopies shall be strong enough to prevent collapse and to prevent penetration by any objects that may fall onto them.

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When **toeboards** are used as protection from falling objects, they shall be erected along the edges of the overhead walking or working surface for a distance sufficient to protect persons working below. Toeboards will be capable of withstanding a force of at least 50 pounds of force applied in any downward or outward direction at any point along the toeboard. Toeboards will be a minimum of four (4) inches tall from their top edge to the level of the walking/working surface, have no more than one (1) inch clearance between its bottom and the surface.

5.4.5 Ladders (where work height (due to leaning out) exposure is equal to, or exceeds six foot and/or the maximum ladder height is within the distance to a leading edge)

If work is performed outside the rails of a ladder equal to, or exceeding 6' ; or if three-point contact on the ladder cannot be maintained, a (Personal) Fall Arrest Systems shall be utilized if anchorage points are available.

If anchorage points are not available or other traditional fall control systems are not feasible, a non-conventional system can be utilized (see 5.3 of this manual section).

5.4.6 Leading Edge Work

Employees working near a leading edge 6 feet or more above lower levels shall be protected by guardrail, safety net, restraint/positioning, or (personal) fall arrest systems. If these systems are not feasible the systems under 5.3 of this manual section can be utilized.


5.4.7 Roadway/Vehicular Passage Covers

Covers located in roadways and vehicular aisles shall be able to support at least twice the maximum axle load of the largest vehicle to which the cover might be subjected, and secured/marked as indicated in 5.2.2 of this manual section.

5.4.8 Roofs (work from or on)

5.4.8.1.1 Low-sloped (<4:12 pitch)

Employees engaged in roof activities on low-slope roofs with unprotected sides and edges 6 feet or more above lower levels will be protected from falling by guardrail systems, safety net systems, (personal) fall arrest systems or a combination of a warning line system and guard-rail system, warning line system and safety net system, warning line system and (personal) fall arrest system, or warning line system and safety monitoring system.

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5.4.8.2 Steep Roofs (>4:12 pitch)

Employees on a steep roof with unprotected sides and edges 6 feet or more above lower levels will be protected by either guardrail systems with toeboards, a safety net system, or a (personal) fall arrest systems.

5.4.9 Wall Openings

Employee working on, at, above, or near wall openings (including those with chutes attached) shall be protected from falling by the use of either a guardrail system, a safety net system, or a (personal) fall arrest system.

5.5 Equipment Inspection and Maintenance Procedures

5.5.1 Inspection, Replacement and Destruction

All equipment hereafter noted shall be visually inspected before each use, replaced immediately if any of the defective conditions are found, tagged 'out of service' and sent back to the Branch for destruction.


5.5.2 Body Harness Inspection

Beginning at one end, holding the body side of the harness toward you, grasp one area of the harness with your hands six to eight inches apart. Bend the strap in an inverted "U". Follow this procedure the entire length of the belt or harness. Watch for frayed edges, broken fibers, pulled stitches, cuts, burn marks or chemical damage. Special attention should be given to the attachment of buckles and D-rings to strap webbing. Inspect for frayed or broken strands. Broken webbing strands generally appear as tufts on the webbing surface.

Rivets should be tight and unmovable with fingers. Body-side rivet base and outside rivet burr should be flat against the material. Bent rivets will fail under stress. Especially note condition of D-ring rivets and D-ring metal wear pads (if applicable). Discolored, pitted, or cracked rivets indicate chemical corrosion.

The tongue or billet of bolts receives heavy wear from repeated buckling and unbuckling. Inspect for loose, distorted, or broken grommets. Harnesses using punched holes without grommets should be checked for torn or elongated holes causing slippage of the tongue buckle.

5.5.3 Hardware (Buckles, D-Rings, Snaps and Thimbles)

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Buckle tongues should be free of distortion in shape and motion. They should overlap the buckle frame and move freely back and forth in their socket. Roller should turn freely on frame. Check for distortion or sharp edges.

Inspect the friction buckle for distortion. The outer bars and center bars must be straight. Pay special attention to corners and attachment points of the center bar.

Inspect the sliding bar buckle frame and sliding bar for cracks, distortion, or sharp edges. The sliding bar should move freely. Knurled edge will slip if worn smooth. Pay special attention to corners and ends of sliding bar.

Inspect the forged steel D-ring for cracks or other defects. Inspect the assembly of the D-ring to the body pad or D-saddle. If the D-ring can be moved vertically independent of the body pad or D-saddle, the harness should be replaced. Check D-Rings and D-Ring metal wear pad (if any) for distortion, cracks, breaks, and rough or sharp edges. The D-Ring bar should be at a 90 degree angle with the long axis of the belt and should pivot freely.

Inspect closely for hook and eye distortions, cracks, corrosion, or pitted surfaces. The keeper (latch) should seal into the nose without binding and should not be distorted or obstructed. The keeper spring should exert sufficient force to firmly close the keeper.

The thimble must be unmovable in the eyes of the splice, and the splice should have no loose or cut strands. The edges must be free of sharp edges, distortion, or cracks.


5.5.4 Lanyard (shock-absorbing)

Begin at one end and work to the opposite end. Slowly rotate the lanyard so the entire circumference is checked. Factory spliced ends require particular attention.

5.5.5 Lanyard (Webbing) Retractable

Bend the webbing over a non-lacerating edge, observe each side of the webbed lanyard. This will reveal any cuts or breaks. Swelling, discoloration, cracks, and charring are obvious signs of chemical or heat damage. Closely observe for any breaks in the stitching.

5.5.6 Rope

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Rotation of the rope lanyard while inspecting from end to end will bring to light any fuzzy, worn, broken, or cut fibers. Areas weakened by extreme loads will appear as noticeable change in original diameter. The rope diameter should be uniform throughout, following a short break-in period. Strands should be separated and inspected since the rope may wear on the inside if grit or moisture becomes embedded.

5.5.7 Storage/Cleaning

Storage areas shall be maintained as clean, dry and free of exposure to fumes or corrosive elements.

Cleaning methods established by the manufacturer shall be followed for all components. Generally, the following applies for body harnesses:


- Wipe off surface dirt with a sponge dampened in plain water. Squeeze the sponge dry. Dip the sponge in a mild solution of water and commercial soap or detergent. Work up a thick lather with a vigorous back and forth motion
- Wipe the belt dry with a clean cloth. Hang freely to dry but away from excessive heat
- Bolts and other equipment should dry thoroughly without close exposure to heat, steam, or long periods of sunlight
- Mildly dirty cotton may be cleaned normally. For heavy dirt or grease, soak belts in a solution of one tablespoon of grease cutter to one gallon of water. **DO NOT USE A STRONGER SOLUTION.** After soaking, rinse again, then hang to dry
- Fall protection, which is not in the original package, shall be stored in a clean, dry area

5.6 Post-Fall or Near-Miss Incidents

Fall incidents and near-misses shall be thoroughly investigated to determine root causes and facilitate corrective measures to prevent reoccurrences.

Employees involved in a fall equal to, or greater than 6' shall be required to receive an immediate medical evaluation.


All components of a (personal) fall arrest system involved in any fall with a fall distance of over six feet shall be immediately and completely replaced. Such equipment shall be tagged 'out of service' and sent back to the Branch for destruction.

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6.0 References

OSHA 29 CFR 1926 Subpart M

OSHA 29 CFR 1910 Subpart D

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1.0 Policy

ATC Associates (ATC) policy is that employees should not enter a trench or excavation unless it is absolutely necessary. If entry is to be made into a trench or excavation greater specific precautions detailed in this Policy must be taken. Excavation work activities shall be conducted safely with associated exposures eliminated and/or controlled.

This policy covers minimum performance standards applicable to all ATC employees, ATC Subcontractors, and ATC locations. Client and local practices requiring more detailed or stringent rules, or local, state or other federal requirements regarding this subject can and should be added as an addendum to this procedure as applicable.

2.0 Purpose

To ensure that every ATC employee, ATC Subcontractors, and the general public are protected against foreseeable hazards associated with excavation work.

3.0 Scope

Applies to all ATC work sites, i.e., ATC offices, client job sites, etc., where work activities require an excavation or trench either made by ATC or another party not associated with ATC.

4.0 Definitions


4.1 General Definitions

Approved - means, for the purpose of this Policy, authorized by ATC, tested, and certified by the manufacturer or any recognized national testing laboratory to possess the strength requirements specified in this section.

Competent Person - means one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has the authorization to take prompt corrective measures to eliminate them.

Construction Work - means work for construction, alteration, and/or repair, to new underground utilities.

Defect - means any characteristic or condition that tends to weaken or reduce the strength of the tool, object, or structure of which it is a part.

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Employee - means every laborer regardless of title or contractual relationship.

Service Work - means work for alteration and/or repair of existing underground utilities.

Work Area - means that portion of a walking/working surface where work activities are being performed.

4.2 General Excavation Definitions

Aluminum Hydraulic Shoring - means a pre-engineered shoring system comprised of aluminum hydraulic cylinders (crossbraces) used in conjunction with vertical rails (uprights) or horizontal rails (wales). Such system is designed specifically to support the sidewalls of an excavation and prevent cave-ins.

Benching (Benching System) - means a method of protecting employees from cave-ins by excavating the sides of an excavation to form one or a series of horizontal levels or steps, usually with vertical or near-vertical surfaces between levels.


Cave-In - means the separation of a mass of soil or rock material from the side of an excavation, or the loss of soil from under a trench shield or support system, and its sudden movement into the excavation, either by falling or sliding, in sufficient quantity so that it could entrap, bury, or otherwise injure and immobilize a person.

Cross Braces - mean the horizontal members of a shoring system installed perpendicular to the sides of the excavation, the ends of which bear against either uprights or wales.

Distress - means that the soil is in a condition where a cave-in is imminent or is likely to occur. Distress is evidenced by such phenomena as the development of fissures in the face of or adjacent to an open excavation; the subsidence of the edge of an excavation; the slumping of material from the face or the bulging or heaving of material from the bottom of an excavation; the spalling of material from the face of an excavation; and ravelling (i.e., small amounts of material such as pebbles or little clumps of material suddenly separating from the face of an excavation and trickling or rolling down into the excavation).

Excavation - means any man-made cut, cavity, trench, or depression in an earth surface, formed by earth removal.

Faces or Sides - means the vertical or inclined earth surfaces formed as a result of excavation work.

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Failure - means the breakage, displacement, or permanent deformation of a structural member or connection so as to reduce its structural integrity and its supportive capabilities.

Hazardous atmosphere - means an atmosphere which by reason of being explosive, flammable, poisonous, corrosive, oxidizing, irritating, oxygen deficient, toxic, or otherwise harmful, may cause death, illness, or injury.

Kickout - means the inadvertent release or failure of a cross brace.

Maximum Allowable Slope - means the steepest incline of an excavation face that is acceptable for the most favorable site conditions as protection against cave-ins, and is expressed as the ratio of horizontal distance to vertical rise (H:V).

Protective System - means a method of protecting employees from cave-ins, from material that could fall or roll from an excavation face or into an excavation, or from the collapse of adjacent structures. Protective systems include support systems, sloping and benching systems, shield systems, and other systems that provide the necessary protection.

Ramp - means an inclined walking or working surface that is used to gain access to one point from another, and is constructed from earth or from structural materials such as steel or wood.

Registered Professional Engineer (P.E.) - means a person who is registered as a Professional Engineer in the state where the work is to be performed.


Sheeting - means the members of a shoring system that retain the earth in position and in turn are supported by other members of the shoring system.

Shield (Shield System) - means a structure that is able to withstand the forces imposed on it by a cave-in and thereby protect employees within the structure. Shields can be permanent structures or can be designed to be portable and moved along as work progresses. Additionally, shields can be either premanufactured or job-built in accordance with this Policy. Shields used in trenches are usually referred to as "trench boxes" or "trench shields."

Shoring (Shoring System) - means a structure such as a metal hydraulic or mechanical shoring system that supports the sides of an excavation and which is designed to prevent cave-ins.

Sides. See **Faces**.

Sloping (Sloping System) - means a method of protecting employees from cave-ins by excavating to form sides of an excavation that are inclined away from the

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excavation so as to prevent cave-ins. The angle of incline required to prevent a cave-in varies with differences in such factors as the soil type, environmental conditions of exposure, and application of surcharge loads.

Stable Rock - means natural solid mineral material (not soil) that can be excavated with vertical sides and will remain intact while exposed.

Structural Ramp - means a ramp built of steel or wood, usually used for vehicle access.

Support System - means a structure such as underpinning, bracing, or shoring, which provides support to an adjacent structure, underground installation, or the sides of an excavation.

Trench (Trench Excavation) means a narrow excavation (in relation to its length) made below the surface of the ground.

Trench Box or Trench Shield. See **Shield**.

Uprights - means the vertical members of a trench shoring system placed in contact with the earth and usually positioned so that individual members do not contact each other. Uprights placed so that individual members are closely spaced, in contact with or interconnected to each other, are often called "sheeting."

Underground Installations - means utility installations, such as sewer, telephone, fuel, electric, water lines, fiber optic, etc.


Wales - means horizontal members of a shoring system placed parallel to the excavation face whose sides bear against the vertical members of the shoring system or earth.

4.3 Soil Definitions

Cemented Soil - means a soil in which the particles are held together by a chemical agent, such as calcium carbonate, such that a hand-size sample cannot be crushed into powder or individual soil particles by finger pressure.

Cohesive Soil - means clay (fine grained soil), or soil with a high clay content, which has cohesive strength. Cohesive soil does not crumble, can be excavated with vertical sideslopes, and is plastic when moist. Cohesive soil is hard to break up when dry, and exhibits significant cohesion when submerged. Cohesive soils include clayey silt, sandy clay, silty clay, clay, and organic clay.

Dry Soil - means soil that does not exhibit visible signs of moisture content.

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Fissured - means a soil material that has a tendency to break along definite planes of fracture with little resistance, or a material that exhibits open cracks, such as tension cracks, in an exposed surface.

Granular Soil - means gravel, sand, or silt (coarse grained soil) with little or no clay content. Granular soil has no cohesive strength. Some moist granular soils exhibit apparent cohesion. Granular soil cannot be molded when moist and crumbles easily when dry.

Layered System - means two or more distinctly different soil or rock types arranged in layers.

Moist Soil - means a condition in which a soil looks and feels damp. Moist cohesive soil can easily be shaped into a ball and rolled into small diameter threads before crumbling. Moist granular soil that contains some cohesive material will exhibit signs of cohesion between particles.

Plastic - means a property of a soil which allows the soil to be deformed or molded without cracking or appreciable volume change.

Saturated Soil - means a soil in which the voids are filled with water. Saturation does not require flow. Saturation, or near saturation, is necessary for the proper use of instruments such as a pocket penetrometer or shear vane.


Soil Classification System - means, for the purpose of this Policy, a method of categorizing soil and rock deposits in a hierarchy of Stable Rock, Type A, Type B, and Type C, in decreasing order of stability. The categories are determined based on an analysis of the properties and performance characteristics of the deposits and the characteristics of the deposits and the environmental conditions of exposure.

Stable Rock - means natural solid mineral matter that can be excavated with vertical sides and remain intact while exposed.

Submerged Soil - means soil which is under water or is free seeping.

Type A - means cohesive soils with an unconfined, compressive strength of 1.5 tons per square foot (tsf) (144 kPa) or greater. Examples of cohesive soils are: clay, silty clay, sandy clay, clay loam and, in some cases, silty clay loam and sandy clay loam. Cemented soils such as caliche and hardpan are also considered Type A. However, no soil is Type A if any of the following are noted:

- The soil is fissured; or
- The soil is subject to vibration from heavy traffic, pile driving, or similar effects; or
- The soil has been previously disturbed; or

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- The soil is part of a sloped, layered system where the layers dip into the excavation on a slope of four horizontal to one vertical (4H:1V) or greater; or
- The material is subject to other factors that would require it to be classified as a less stable material.

Type B - means cohesive soil with an unconfined compressive strength greater than 0.5 tsf (48 kPa) but less than 1.5 tsf (144 kPa); or

Granular cohesionless soils including: angular gravel (similar to crushed rock), silt, silt loam, sandy loam and, in some cases, silty clay loam and sandy clay loam.

Previously disturbed soils except those which would otherwise be classed as Type C soil.

Soil that meets the unconfined compressive strength or cementation requirements for Type A, but is fissured or subject to vibration; or

Dry rock that is not stable; or


Material that is part of a sloped, layered system where the layers dip into the excavation on a slope less steep than four horizontal to one vertical (4H:1V), but only if the material would otherwise be classified as Type B.

Type C - means cohesive soil with an unconfined compressive strength of 0.5 tsf (48kPa) or less; or

- Granular soils including gravel, sand, and loamy sand; or
- Submerged soil or soil from which water is freely seeping; or
- Submerged rock that is not stable, or
- Material in a sloped, layered system where the layers dip into the excavation or a slope of four horizontal to one vertical (4H:1V) or steeper.

Unconfined Compressive Strength - means the load per unit area at which a soil will fail in compression. It can be determined by laboratory testing, or estimated in the field using a pocket penetrometer, by thumb penetration tests, and other methods.

Wet Soil - means soil that contains significantly more moisture than moist soil, but in such a range of values that cohesive material will slump or begin to flow when vibrated. Granular material that would exhibit cohesive properties when moist will lose those cohesive properties when wet.

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5.0 Excavation and Trenching Requirements

5.1 General Requirements

The Project Manager must identify prior to the start of a project involving an excavation or trench a Competent Person for the project. The site specific Health and Safety Plan (HASP) written for the project must include an Excavation Work Plan. The HASP should identify the Competent Person for the project and this person must review the HASP prior to the start of work.

ATC, in accordance with OSHA, requires that a Competent Person be on-site during trenching or excavation activities and when an employee enters into the trench or excavation.

5.2 Competent Person

A Competent Person must have the following qualifications documented in the ATC employee's health and safety training file:


- 1) Be able to identify, predict and eliminate or protect employees from trenching/excavation hazards.
- 2) Have authority to eliminate hazards and stop work if necessary.
- 3) Understand, implement, and meet the requirements of 29CFR1926, Subpart P.
- 4) Be able to evaluate protective systems (shielding, shoring and sloping).
- 5) Be able to perform soil classification tests.

The Project Manager should verify this training information if a Subcontractors employee will be acting as the Competent Person for ATC while on an ATC project site.

5.3 Written Excavation Work Plan (\geq 5 Ft. in depth)

A Competent Person shall review any Excavation Work Plan as part of the project site HASP for every excavation exceeding five feet in depth to determine compliance with ATC policies, Client requirements, and regulatory obligations.

NOTE: A written Excavation Work Plan is not required when ATC will be working in an excavation or trench controlled by a third party on a Client project site, but the Competent Person for the ATC Branch must review the third party Excavation Work Plan to confirm that all safety requirements are addressed.

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In the event that the Client has not developed site specific procedures on how to keep personnel safe while performing work within an excavation or trench then, ATC employees must not enter the excavation or trench until ATC, working with the Client, can provide for a safe working area.

An example of a written Excavation Work Plan can be found at Appendix 16-01.

The written Excavation Work Plan shall include:


- Identification of the safety hazards associated with the excavation equipment;
- Describe the excavation protection system(s) to be used;
- Describe the soil type and the correct procedures for the selection, fit, use and maintenance of the excavation protection system;
- Describe procedures for excavation;
- Describe the method for prompt, safe removal of injured workers;
- Identification of Competent Person(s) for the excavation project;
- Signature of the Competent Person.

5.4 Training

Initial training of ATC employees shall occur during the new hire orientation for new ATC employees who foreseeably will be engaged in excavation work. All current ATC employees will receive this training prior to being assigned work that may expose them to the hazards of an excavation. Hazard recognition and excavation protection systems shall be included in the training. Training will include review of this Policy and completion of an online training course that provides excavation and trenching awareness training.

NOTE: Completion of this training alone does not qualify an ATC employee to be designated as a Competent Person.

Site specific training shall occur before the start of excavation work activities during the daily Tailgate Safety Meeting and will include the hazards and controls noted in the site HASP and the other provisions of the written Excavation Work Plan.

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5.5 Inspections

When ATC or Subcontractor employee exposure in an excavation is reasonably anticipated, an inspection shall be conducted by a Competent Person:

- Prior to the start of work each day;
- As needed throughout the shift;
- After every rainstorm; and
- When an unusual occurrence affects the integrity of the excavation.

The inspection documentation form is included in Attachment 16-02.

NOTE: Where the Competent Person finds evidence of a situation that could result in a possible cave-in, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions, exposed employees shall be removed from the hazardous area until the necessary precautions have been taken to ensure their safety.


Attachment 16-02 shall be completed by the Competent Person prior to someone entering an excavation or trench. All ATC employees should verify that a documented inspection has been performed prior to entry into an excavation or trench. If ATC employees will be entering an excavation or trench controlled by a third party, the employee should contact the Competent Person (must be on-site when ATC employee is in excavation or trench) for the third party to verify it is safe to enter the excavation or trench.

5.6 Personal Protective Equipment

Minimum Personal Protective Equipment (PPE) for ATC or Subcontractor employees entering an excavation or trench shall consist of:

- Approved hardhats;
- Approved safety glasses;
- Approved safety footwear;
- Long pants or coveralls; and
- Leather work gloves

If exposed to vehicular traffic, employees shall be provided with, and shall wear, warning vests or other suitable garments marked with or made of high-visibility material (and be reflective if working in dim light or at night).

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5.7 Multi-Contractor or Client Sites

In situations where ATC employees are performing work on a Client's property and the scope of work includes the need to work in or work around an excavation or trench, the ATC Project Manager should inform the Client representative of the need for assistance in protecting ATC and ATC Subcontractor employees from the hazards of an excavation or trench. The on-site ATC employee should work with the Client appointed Competent Person to safely control the hazards of an entry into an excavation or trench by securing a safe means of access and the proper shoring, shielding, or sloping as designated by this Policy.

In the event that the Client has not developed site specific procedures on how to keep personnel safe while performing work within an excavation or trench then, ATC employees must not enter the excavation or trench until ATC, working with the Client, can provide for a safe working area.

5.8 Protective Systems

All ATC employee(s) in an excavation or trench shall be protected from cave-ins by an adequate protective system designed in accordance with this Policy and OSHA regulations except when:


- Excavations or trenches are made entirely in stable rock; or
- Excavations or trenches are less than 5 feet in depth and examination of the excavation or trench by the onsite Competent Person indicates that it is safe to enter the excavation or trench.

In addition, any above ground structure or underground utility must also be protected from collopase or damage from the excavation or trench. The approved protective systems may be used in an excavation or trench up to 20 feet in depth. The protective systems for an excavation or trench 20 feet or more in depth must be approved by a Registered Professional Engineer.

No ATC employee shall enter an excavation or trench that approaches five feet or more in depth without proper protection from cave-in.

Under no circumstances should protective systems be omitted, regardless of the length of time an employee will be working within the excavation or trench.

5.8.1 Approved Protective Systems

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Sloping and Benching

Classifying Soil - To determine the correct sloping or bench system to be used the onsite Competent Person must classify the soil as either type A, B or C type soils. The acceptable methods for soil classification can be found in section 5.9 of the this Policy. A description of each type of soil can be found in the Definitions section of this Policy.

Maximum allowable slope - The maximum allowable slope for a soil or rock deposit shall be determined from **Table A** of Appendix 16-03 of this Policy.

If additional weight loads to the system are present from stored material or equipment, operating equipment, or traffic, a Competent Person shall determine the degree to which the slope must be reduced below the maximum allowable slope, and will assure that such reduction is achieved.

Employees must not be positioned under loads handled by lifting or digging equipment and must stand clear of loads being loaded or unloaded so they will be safe in the event of the load spilling or slipping.

When mobile equipment (trucks, etc.) is being operated adjacent to the excavation, or when similar equipment must approach the edge of the excavation and the operator does not have clear view of the edge, a warning system (barricades, stop logs, hand signals) must be in place.

Prohibition - Employees shall not be permitted to work on the faces of sloped or benched excavations at levels above other employees except when employees at the lower levels are adequately protected from the hazard of falling, rolling, or sliding material or equipment.


Shielding and Shoring Systems

General - Installation of a support system shall be closely coordinated with the excavation of trenches.

Shield systems shall not be subjected to loads exceeding those which the system was designed to withstand.

Employees shall not be allowed in shield systems when shields are being installed, removed, or moved vertically.

Employees shall be protected from the hazard of cave-ins when entering or exiting the areas protected by shields. This means that the access and

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egress methods shall be included from within the protection of the shielding system.

Excavation of material to a level no greater than 2 feet (.61 m) below the bottom of the members of a shield system shall be permitted.

Materials and equipment - Materials and equipment used for protective systems shall be free from damage or defects that might impair their proper function.

Manufactured materials and equipment used for protective systems shall be used and maintained in a manner that is consistent with the recommendations of the manufacturer.


When material or equipment that is used for protective systems is damaged, a Competent Person shall examine the material or equipment and evaluate its suitability for continued use. If the Competent Person cannot assure the material or equipment is able to support the intended loads or is otherwise suitable for safe use, then such material or equipment shall be removed from service. Manufactured material or equipment, in this case, shall be evaluated and approved by the manufacturer or a Registered Professional Engineer before being returned to service.

Designs for shoring in trenches or excavations shall be determined in accordance with the conditions and requirements set forth by the manufacturer or with the Aluminum Hydraulic Shoring for Trenches Table (B-1) of Appendix 16-04 of this Policy.

NOTE: Aluminum Hydraulic Shoring is preferred to Timber Shoring. However, if Timber Shoring is more feasible or practical, it shall be utilized in accordance with OSHA 29CFR1926 Subpart P, Appendix C.

Combination Systems

If the excavation is of a depth whereby the shielding or shoring system is not of sufficient height, sloping or benching of the excavation sides may be utilized in combination with a shielding or shoring system. Appendix 16-04 contains diagrams of acceptable combination systems. Additional protective systems may be used, but only when approved by a Registered Professional Engineer.

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Installation and removal of support

Members of support systems shall be securely connected together to prevent sliding, falling, kickouts, or other predictable failure.

Support systems shall be installed and removed in a manner that protects employees from cave-ins, structural collapses, or from being struck by members of the support system.

Individual members of support systems shall not be subjected to loads exceeding those which those members were designed to withstand.

Before temporary removal of individual members begins, additional precautions shall be taken to ensure the safety of employees, such as installing other structural members to carry the loads imposed on the support system.

Removal shall begin at, and progress from, the bottom of the excavation. Members shall be released slowly so as to note any indication of possible failure of the remaining members of the structure or possible cave-in of the sides of the excavation.

Backfilling shall progress together with the removal of support systems from excavations.


Requiring Registered Professional Engineer

Excavation protection system configurations requiring development by a Registered Professional Engineer:

- Excavations greater than twenty (20) feet in depth;
- Any excavation below the level of the base or footing of any foundation or retaining wall that could be reasonably expected to pose a hazard to employees; and
- Where the stability of adjoining buildings, walls, or other structures is endangered by excavation operations

Designs shall be in written form and will include at least the following:

- The protective system configurations that were determined to be safe for the particular project;
- The identity and stamped seal of the Registered Professional Engineer approving the design; and

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- At least one copy of the design shall be maintained at the jobsite.

5.9 Specific Excavation Hazard Controls

5.9.1 Access and Egress

Structural ramps that are used solely by employees as a means of access or egress from excavations shall be designed by a Competent Person.

Ramps and runways constructed of two or more structural members shall have the structural members connected together to prevent displacement.

Structural members used for ramps and runways shall be of uniform thickness.

Cleats or other appropriate means used to connect runway structural members shall be attached to the bottom of the runway or shall be attached in a manner to prevent tripping.

Structural ramps used in lieu of steps shall be provided with cleats or other surface treatment on the top surface to prevent slipping.


A means of egress from trench excavations shall always be maintained. A stairway, ladder, ramp, or other safe means of egress shall be located in trench excavations that are 4 feet or more in depth so as to require no more than 25 feet of lateral travel for employees.

Employees shall not utilize mechanical equipment to access or egress from trench excavations.

5.9.2 Exposure to Falling Loads

Employees shall be protected from excavated or other materials or equipment that could pose a hazard by falling or rolling into excavations. Protection shall be provided by placing and keeping such materials or equipment at least 2 feet (.61 m) from the edge of excavations, or by the use of retaining devices that are sufficient to prevent materials or equipment from falling or rolling into excavations, or by a combination of both if necessary.

Whether inside or outside of an excavation, no ATC or Subcontractor employee shall be permitted underneath a load handled by lifting or excavation equipment. Employees shall stand away from any vehicle

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being loaded or unloaded to avoid being struck by any spillage or falling materials.

Operators of such vehicles being loaded or unloaded are required to remain out of the cabs of vehicles during loading or unloading.

5.9.3 Hazardous Atmospheres

Where oxygen deficiency (atmospheres containing less than 19.5 percent oxygen) or a hazardous atmosphere exists or could reasonably be expected to exist, such as in excavations in landfill areas or excavations in areas where hazardous substances are or had previously been used or stored nearby, the atmospheres in the excavation shall be tested before employees enter excavations.


No ATC employee shall enter a trench or excavation containing an explosive atmosphere (greater than 10% of the lower explosive limit) or an oxygen enriched atmosphere (greater than 23.5% O₂). Likewise, personnel shall not enter if the atmosphere is oxygen deficient (less than 19.5%) unless equipped with a self-contained breathing apparatus or air-line respirators equipped with emergency escape air packs.

The use of such respiratory equipment must comply with provisions of the ATC Policy No. 27 (Respiratory Protection). Employees entering excavations containing levels of toxic gases or vapors may require the use of respiratory protection and other means of protection and must be addressed on a case by case nature depending upon the contaminant.

Ventilation of the excavation or other similar measures should be implemented to eliminate oxygen deficient/enriched, flammable, or toxic atmospheres prior to entry. When these measures are in place, testing of the atmosphere shall be conducted as often as necessary to ensure that the atmosphere remains safe.

In addition to air monitoring, emergency rescue equipment must be readily available where hazardous atmospheric conditions exist or can reasonably be expected to exist. This equipment, such as a breathing apparatus, a safety harness or line, etc. shall be attended by an employee trained in its use.

See ATC Policy No. 10 (Confined Spaces) of this Manual for more information.

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5.9.4 Mobile Equipment

When mobile equipment is operated adjacent to an excavation, or when such equipment is required to approach the edge of an excavation, and the operator does not have a clear and direct view of the edge of the excavation, a warning system shall be utilized such as barricades, spotter using hand or mechanical signals, or stop logs.

5.9.5 Underground Installations


Utility companies or owners shall be contacted within established or customary local response times, advised of the proposed work, and asked to establish the location of the utility underground installations prior to the start of actual excavation. When utility companies or owners cannot respond to a request to locate underground utility installations within 24 hours (unless a longer period is required by state or local law), or cannot establish the exact location of these installations, the work may proceed, provided the employees do so with caution, and provided detection equipment or other acceptable means to locate utility installations are used.

When excavation operations approach the estimated location of underground installations, the exact location of the installations shall be determined by safe and acceptable means. While the excavation is open, underground installations shall be protected, supported or removed as necessary to safeguard employees. Refer to ATC Policy No. 33 (Subsurface Investigation) which contains specific information.

5.9.6 Water Accumulation

Employees shall not work in excavations in which there is accumulated water, or in excavations in which water is accumulating, unless adequate precautions have been taken to protect employees against the hazards posed. The precautions necessary to protect employees include special support or shield systems to protect from cave-ins and/or water removal to control the level of accumulating water.

If water is controlled or prevented from accumulating by the use of water removal equipment, the water removal equipment and operations shall be monitored by a Competent Person to ensure proper operation, and to ensure that the equipment does not create additional hazards, such as carbon monoxide, in the trench or excavation.

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If excavation work interrupts the natural drainage of surface water (such as streams), diversion ditches, dikes, or other suitable means shall be used to prevent surface water from entering the excavation and to provide adequate drainage of the area adjacent to the excavation.

5.9.7 Protection of Employees from Loose Rock, Soil, Equipment and Materials

Adequate protection shall be provided to protect employees from loose rock or soil that could pose a hazard by falling or rolling from an excavation face. Such protection can consist of:

- Scaling to remove loose material;
- Installation of protective shields / barricades at intervals as necessary on the face to stop and contain falling material; or
- Other means that provides equivalent protection.

Such rock, soil, and materials and equipment shall additionally be kept at least 2 feet (.61 m) from the edge of excavations.


5.9.8 Fall protection

If employees or equipment are required to cross over excavations, walkways or bridges with standard guardrails shall be provided.

Employees entering bell-bottom pier holes, or other similar deep and confined footing excavations, shall wear a full-body harness with a lifeline securely attached to it. The lifeline shall be separate from any line used to handle materials, and shall be individually attended at all times while the employee wearing the lifeline is in the excavation.

Excavations shall be barricaded to prevent employees and others from falling into them. When an excavation must be left open for the duration of the construction work, barricades and warning signs shall be used. Upon completion of the work, excavations, pits, etc. should be backfilled.

See ATC Policy No. 17 (Fall Protection) for more information.

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5.10 Classifying Soils

5.10.1 Classification of soil and rock deposits

Each soil and rock deposit shall be classified by a Competent Person as Stable Rock, Type A, Type B, or Type C in accordance with the definitions in this Policy.

The classification of the deposits shall be made based on the results of at least one visual and at least one manual analysis. Such analyses shall be conducted by a Competent Person using tests described within this Policy.

In a layered system, the system shall be classified in accordance with its weakest layer. However, each layer may be classified individually where a more stable layer lies under a less stable layer.

If, after classifying a deposit, the properties, factors, or conditions affecting its classification change in any way, the changes shall be evaluated by a Competent Person. The deposit shall be reclassified as necessary to reflect the changed circumstances.


5.10.2 Acceptable visual and manual tests

5.10.2.1 Visual tests

Observe samples of soil that are excavated and soil in the sides of the excavation. Estimate the range of particle sizes and the relative amounts of the particle sizes. Soil that is primarily composed of fine-grained material is cohesive material. Soil composed primarily of coarse-grained sand or gravel is granular material.

Observe soil as it is excavated. Soil that remains in clumps when excavated is cohesive. Soil that breaks up easily and does not stay in clumps is granular.

Observe the side of the opened excavation and the surface area adjacent to the excavation. Crack-like openings such as tension cracks could indicate fissured material. If chunks of soil fall off a vertical side, the soil could be fissured. Small falls are evidence of moving ground and are indications of potentially hazardous situations.

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Observe the area adjacent to the excavation and the excavation itself for evidence of existing utility and other underground structures, and to identify previously disturbed soil.

Observe the opened side of the excavation to identify layered systems.

Observe the area adjacent to the excavation and the sides of the opened excavation for evidence of surface water, water seeping from the sides of the excavation, or the location of the level of the water table.

Observe the area adjacent to the excavation and the area within the excavation for sources of vibration that may affect the stability of the excavation face.


5.10.2.2 Manual tests

5.10.2.2.1 Plasticity

Mold a moist or wet sample of soil into a ball and attempt to roll it into threads as thin as 1/8-inch in diameter for a length of at least 2 inches. Cohesive material can be successfully rolled into threads without crumbling.

5.10.2.2.2 Dry Strength

If the soil is dry and crumbles on its own or with moderate pressure into individual grains or fine powder, it is granular (any combination of gravel, sand, or silt). If the soil is dry and falls into clumps that break up into smaller clumps, but the smaller clumps can only be broken up with difficulty, it may be clay in any combination with gravel, sand or silt. If the dry soil breaks into clumps which do not break up into small clumps and which can only be broken with difficulty, and there is no visual indication the soil is fissured, the soil may be considered un-fissured.

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5.10.2.2.3 Thumb Penetration

The thumb penetration test can be used to estimate the unconfined compressive strength of cohesive soils. Type A soils with an unconfined compressive strength of 1.5 tsf can be indented by the thumb with very great effort. Type C soils with an unconfined compressive strength of 0.5 tsf can be easily penetrated several inches by the thumb, and can be molded by light finger pressure.

This test should be conducted on an undisturbed soil sample, such as a large clump of spoil, as soon as practicable after excavation to keep to a minimum the effects of exposure to drying influences.

If the excavation is later exposed to wetting influences (rain, flooding), the classification of the soil must be changed accordingly.


5.10.2.2.4 Other Strength Tests

Estimates of unconfined compressive strength of soils can also be obtained by use of a pocket penetrometer or by using a hand-operated shearvane.

5.10.2.2.5 Drying Test

The basic purpose of the drying test is to differentiate between cohesive material with fissures, un-fissured cohesive material, and granular material. The procedure for the drying test involves drying a sample of soil that is approximately one inch thick (2.54 cm) and six inches (15.24 cm) in diameter until it is thoroughly dry, then:

- If the sample develops cracks as it dries, significant fissures are indicated.
- Samples that dry without cracking are to be broken by hand. If considerable force is necessary to break a sample, the soil has significant cohesive material content. The soil can be classified as an un-fissured cohesive material and

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the unconfined compressive strength should be determined.

- If a sample breaks easily by hand, it is either a fissured cohesive material or a granular material. To distinguish between the two, pulverize the dried clumps of the sample by hand or by stepping on them. If the clumps do not pulverize easily, the material is cohesive with fissures. If they pulverize easily into very small fragments, the material is granular.

6.0 Appendices

16-01 – Example Written Excavation Work Plan (In Development)


16-02 – Excavation/Trench Inspection

16-03 – Table A

16-04 – Table B

7.0 References

- Occupational Safety and Health Administration (OSHA), 29 CFR Part 1926, Subpart P (Excavations).

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	Excavation Inspection Checklist	Issue Date:	08-05-2008

Project Site Location: _____ ATC Project No. _____

1.0 Reason for inspection (Check One)				Yes	No
Prior to Start of Work (Daily)					
Routine Inspection During Work					
After Rainstorm					
After a Hazardous Condition (Explain):					
Other (Explain):					
Approximate Dimensions of Excavation/Trench		Length:	Width:	Depth:	
2.0 General Observations and Conditions				Yes	No
Workers have been briefed on excavation hazards related to work					
Area surrounding excavation has been protected to prevent material from inadvertently falling into the excavation and against unauthorized access from equipment, employees, and the general public.					
Utilities have been located, protected and marked.					
Excavation spoils and materials have been placed at least 2 ft away from the edge of the excavation/trench.					
No water seepage/base of excavation is free from water					
Walkways or bridges, with standard guardrails, are provided where persons are required to cross the excavation/trench.					
Foundations, structures, appurtenances, etc., are supported.					
Determination has been made as to whether the excavation/trench is considered a confined space (non-permit or permit required).					
Is the excavation/trench deeper than 4 feet? If yes, is there a stairway, ladder or ramp available within 25 ft lateral travel of all employees in the excavation?					
Is the excavation/trench deeper than 5 feet and will someone be entering the excavation/trench? If yes, complete section 3.0.					
The excavation/trench is safe for workers to enter.					
3.0 Protective Systems Used: (Select One)				Yes	No
• Sloping					
• Combination System (Describe):					
• Trench Box (Manufacturer Name):					
• Shoring System (Manufacturer Name):					
Protective system has been checked for evidence of failure (soil distress, soil fissures, structural damage, etc.)					
4.0 Onsite Documentation					
Is there a Health and Safety Plan (HASP) onsite?					
Is the soil classification correctly identified in the HASP?					
If the excavation is greater than 25 feet in depth does the onsite HASP contain the Registered Professional Engineer (PE) approved protective plan?					
Are all regulatory permits (State or Local) available onsite?					
Date of Inspection:		Time of Inspection:			
Signature of Competent Person: _____					
Competent Person's Name (Printed):					


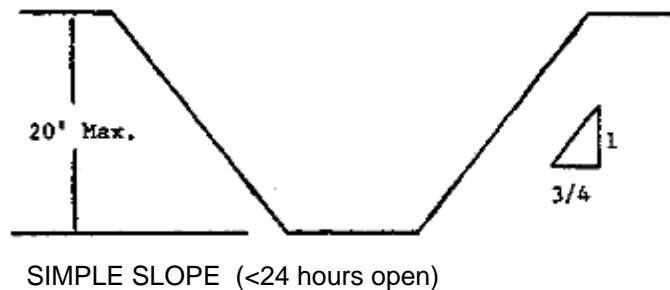
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TABLE A-1 MAXIMUM ALLOWABLE SLOPES

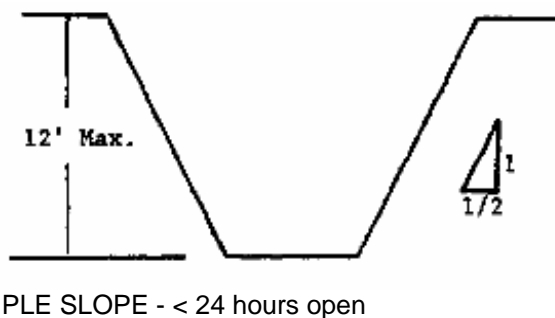
SOIL OR ROCK TYPE	MAXIMUM ALLOWABLE SLOPES FOR EXCAVATIONS LESS THAN 20 FEET DEEP
STABLE ROCK	VERTICAL (90 Degrees from the horizontal)
TYPE A	$\frac{3}{4}$ to 1 (approximately 53 Degrees from the horizontal)
TYPE B	1 to 1 (45 Degrees from the horizontal)
TYPE C	1 $\frac{1}{2}$ to 1 (approximately 34 Degrees from the horizontal)


Simple Slopes Made In Type A Soil:

All simple slope excavation 20 feet or less in depth will have a maximum allowable slope of $\frac{3}{4}$ to 1.



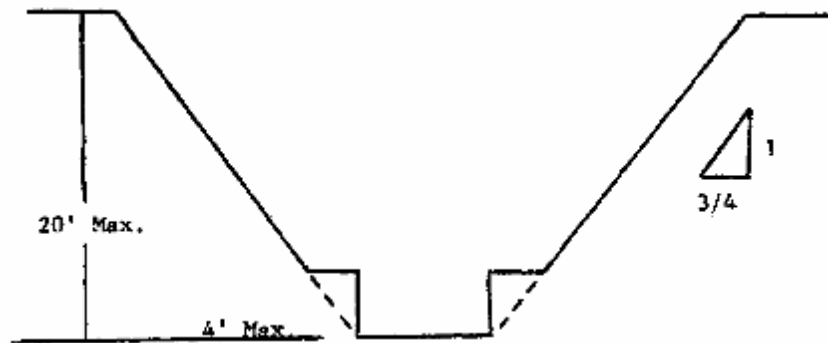
Exception: Simple slope excavations which are open 24 hours or less (**short term**) and which are 12 feet or less in depth will have a maximum allowable slope of $\frac{1}{2}$ to 1.



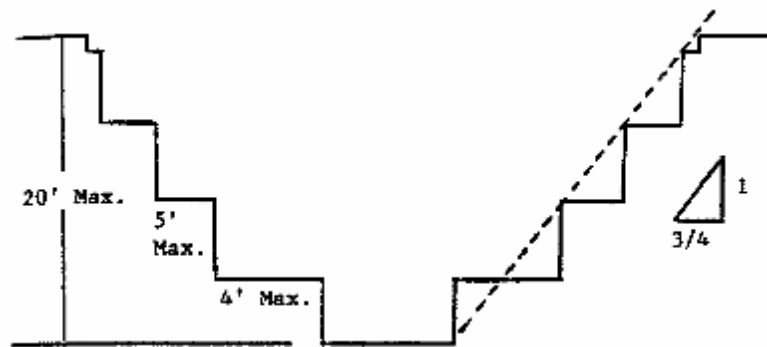
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Benched Excavations Made In Type A Soil

All benched excavations 20 feet or less in depth will have a maximum allowable slope of $\frac{3}{4}$ to 1 and maximum bench dimensions as follows:



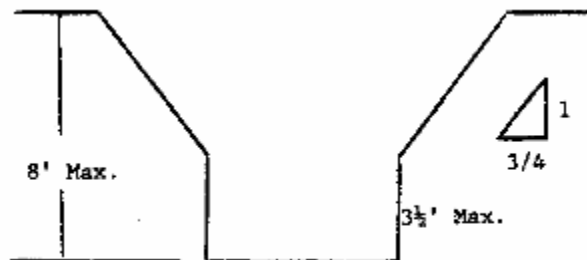
SIMPLE BENCH




MULTIPLE BENCH

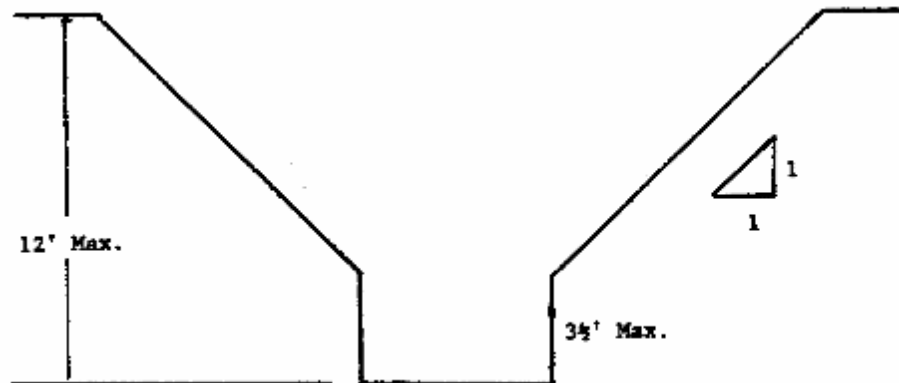
Unsupported Vertically Sided Lower Portion Made In Type A Soil

All excavations 8 feet or less in depth which have unsupported vertically sided lower portions will have a maximum vertical side of $3\frac{1}{2}$ feet, with the remaining upper vertical sides sloped at $\frac{3}{4}$ to 1.



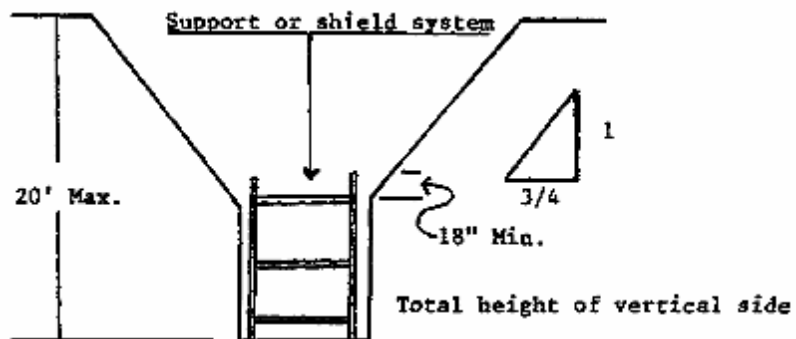
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All excavations more than 8 feet but not more than 12 feet in depth with unsupported vertically sided lower portions will have a maximum allowable slope of 1 to 1 and a maximum vertical side of 3 1/2 feet.




Supported Or Shielded (Vertically Sided Lower Portion) Made In Type A Soil

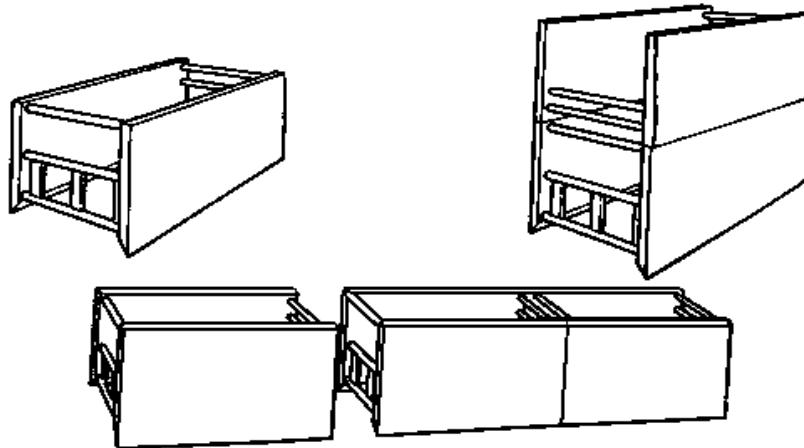
All excavations 20 feet or less in depth which have vertically sided lower portions that are supported or shielded will have a maximum allowable slope of 3/4 to 1. The support or shield system must extend at least 18 inches above the top of the vertical side.



SUPPORTED OR SHIELDED VERTICALLY SIDED LOWER PORTION

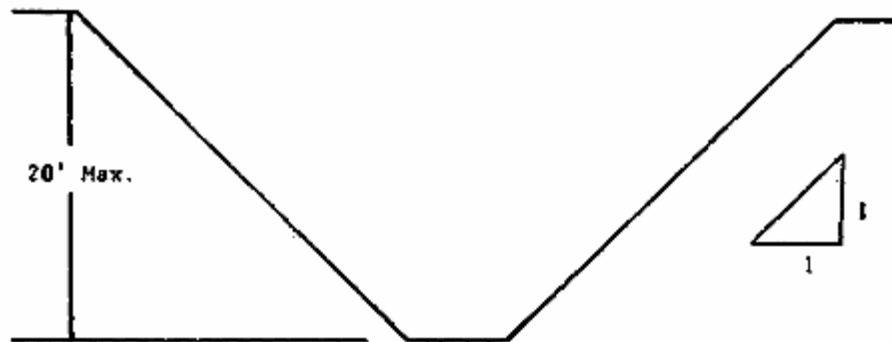
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Trench Shield (Trench Box) Configurations



Simple Slopes Made In Type B Soil

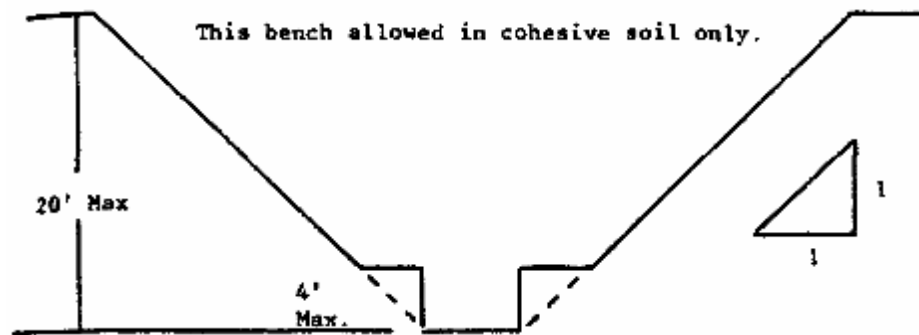
All simple slope excavations 20 feet or less in depth will have a maximum allowable slope of 1 to 1.



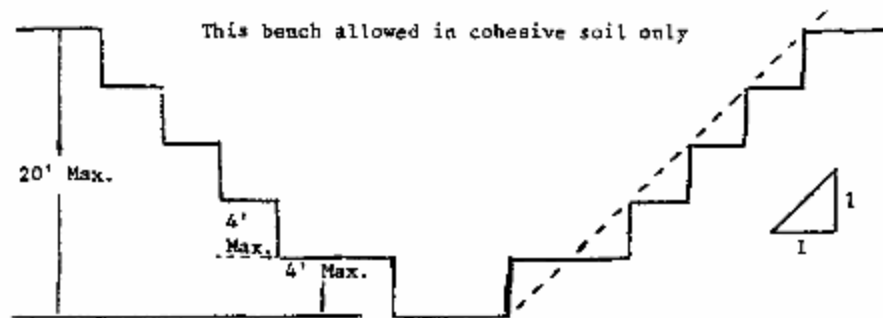
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Benched Excavations Made In Type B Soil


All benched excavations 20 feet or less in depth will have a maximum allowable slope of 1 to 1 and maximum bench dimensions as follows (but only in cohesive soil):



SINGLE BENCH

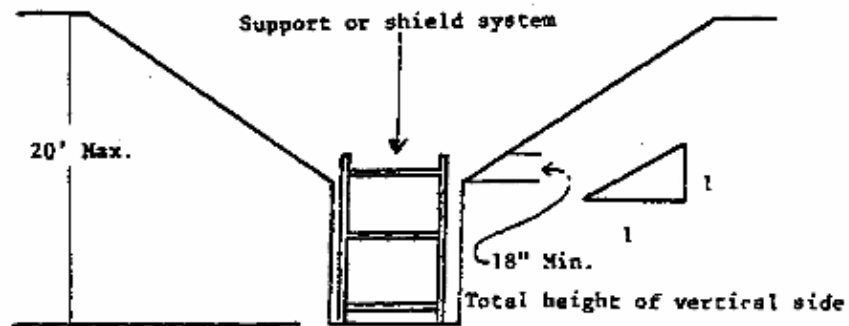


MULTIPLE BENCH

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Vertically Sided Lower Portion Made In Type B Soil

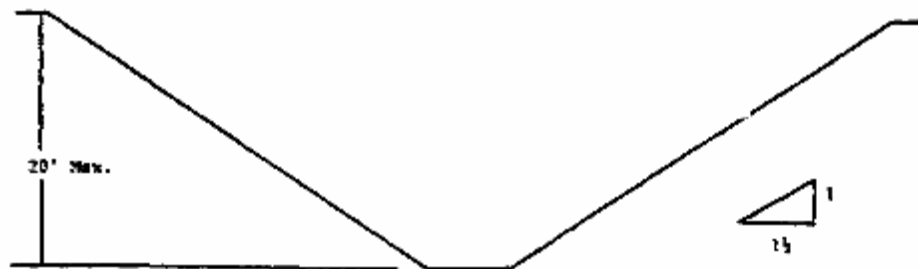
All excavations 20 feet or less in depth which have vertically sided lower portions will be shielded or supported to a height at least 18 inches above the top of the vertical side. All such excavations will have a maximum allowable slope of 1 to 1




Excavations made in Type C soil.

Simple Slope Made In Type C Soil

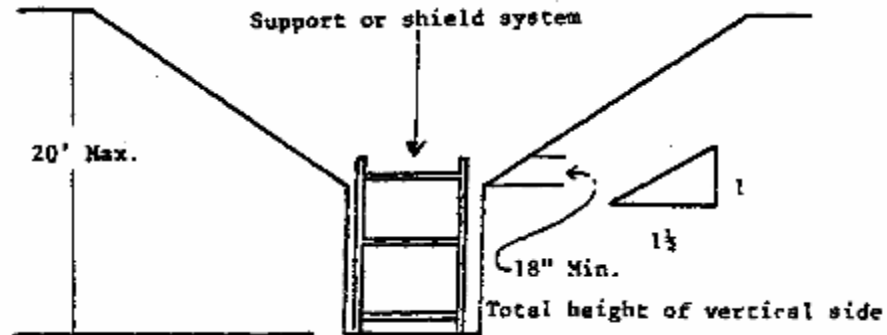
All simple slope excavations 20 feet to/including 4 feet in depth will have a maximum allowable slope of 1 ½ to 1.



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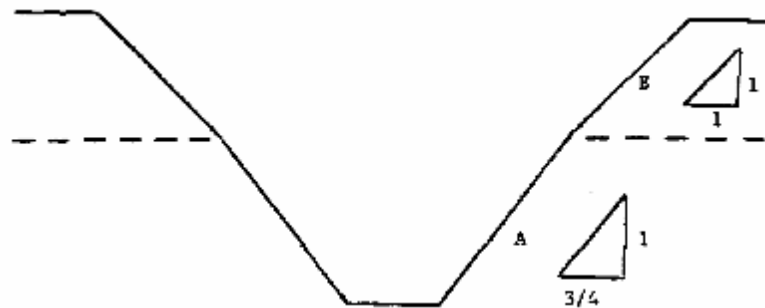
SIMPLE SLOPE

All excavations 20 feet or less in depth which have vertically sided lower portions will be shielded or supported to a height at least 18 inches above the top of the vertical side. All such excavations will have a maximum allowable slope of 1 ½ to 1.

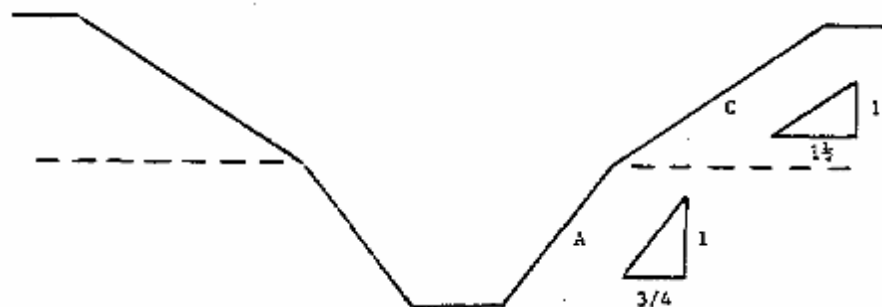


Excavations made in Type layered soils. Sloped Excavations Made In Layered Soils.


All excavations 20 feet or less in depth made in layered soils will have a maximum allowable slope for each layer as set forth below.

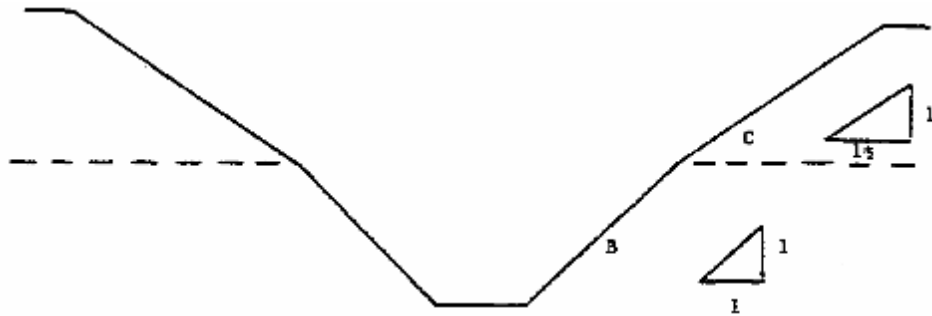


TYPE B (1 to 1 slope) OVER TYPE A (3/4 to 1 slope)

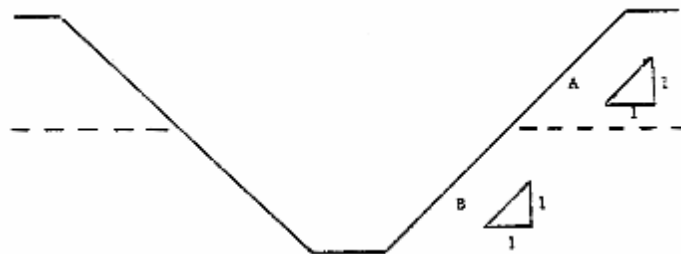


TYPE C (1 ½ to 1 slope) OVER TYPE A (3/4 to 1 slope)

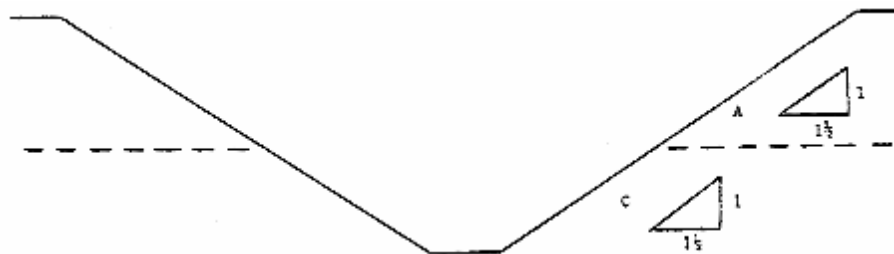
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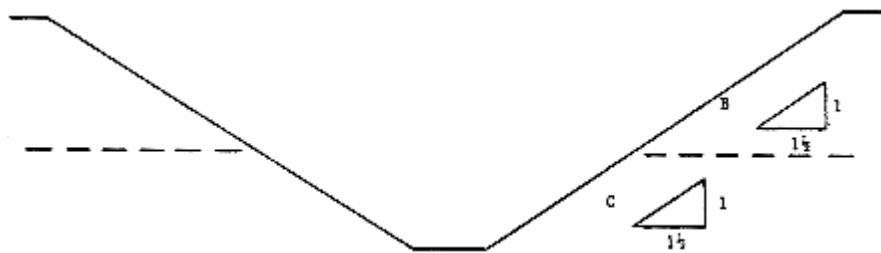
TYPE C (1 ½ to 1 slope) OVER TYPE B (1 to 1 slope)



TYPE A OVER TYPE B (both 1 to 1 slopes)



TYPE A OVER TYPE C (both 1 ½ to 1 slopes)



TYPE B OVER TYPE C (both 1 ½ to 1 slopes)


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	Table B – Aluminum Hydraulic Shoring	Issue Date:	08-05-2008

TABLE B - 1 ALUMINUM HYDRAULIC SHORING

VERTICAL SHORES

FOR SOIL TYPE A

DEPTH OF TRENCH (feet)	HYDRAULIC CYLINDERS				
	MAXIMUM HORIZONTAL SPACING (center to center in feet)	MAXIMUM VERTICAL SPACING (center to center in feet)	WIDTH OF TRENCH (feet)		
			UP TO 8	OVER 8 UP TO 12	OVER 12 UP TO 15
over 5 up to 10	8	4	2 INCH DIAMETER*	2 INCH DIAMETER*	3 INCH DIAMETER*
over 10 up to 15	8				
over 15 up to 20	7				
OVER 20	Designed by Registered Professional Engineer				

* Safe working capacity of a 2 inch diameter cylinder must be at least 18,000 pounds; safe working capacity of a 3 inch diameter cylinder must be at least 30,000 pounds; vertical shoring rails will have a minimum section modulus of 0.40 inch; when vertical shores are used, there must be a minimum of three shores spaced equally, horizontally, in a group.


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TABLE B - 1 ALUMINUM HYDRAULIC SHORING

VERTICAL SHORES

FOR SOIL TYPE B

DEPTH OF TRENCH (feet)	HYDRAULIC CYLINDERS				
	MAXIMUM HORIZONTAL SPACING (center to center in feet)	MAXIMUM VERTICAL SPACING (center to center in feet)	WIDTH OF TRENCH (feet)		
			UP TO 8	OVER 8 UP TO 12	OVER 12 UP TO 15
over 5 up to 10	8	4	2 INCH DIAMETER*	2 INCH DIAMETER*	3 INCH DIAMETER*
over 10 up to 15	6.5				
over 15 up to 20	5.5				
OVER 20	Designed by Registered Professional Engineer				

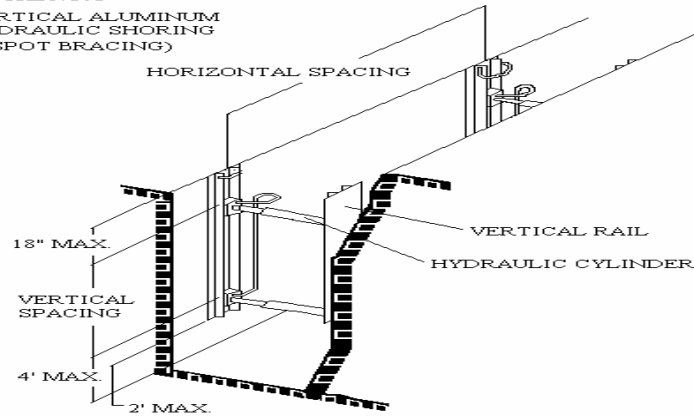
* Safe working capacity of a 2 inch diameter cylinder must be at least 18,000 pounds; safe working capacity of a 3 inch diameter cylinder must be at least 30,000 pounds; vertical shoring rails will have a minimum section modulus of 0.40 inch; when vertical shores are used, there must be a minimum of three shores spaced equally, horizontally, in a group.

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Vertical aluminum hydraulic shoring (spot bracing)

FIGURE NO. 1

VERTICAL ALUMINUM
HYDRAULIC SHORING
(SPOT BRACING)

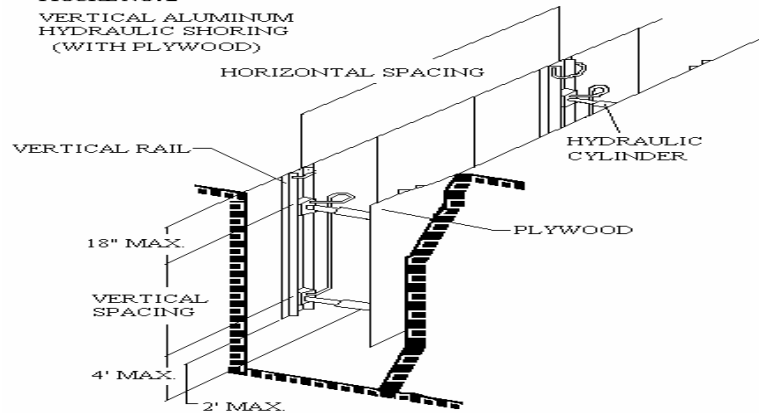


Vertical aluminum hydraulic shoring (with plywood)

Plywood shall be 1.125 inch thick softwood or equivalent.

FIGURE NO. 2

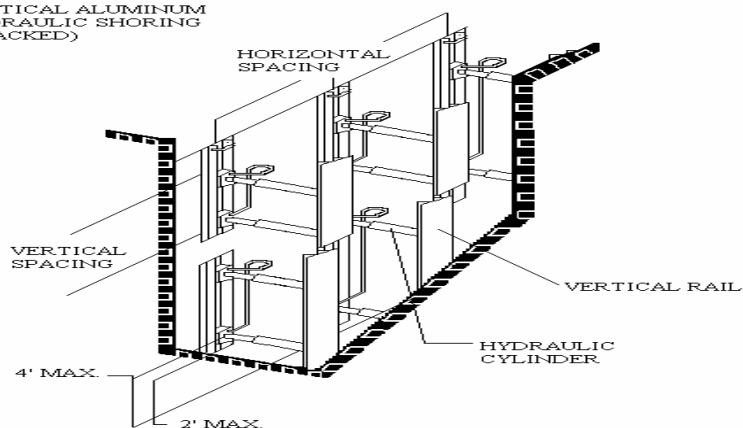
VERTICAL ALUMINUM
HYDRAULIC SHORING
(WITH PLYWOOD)



Vertical aluminum hydraulic shoring (stacked)

FIGURE NO. 3

VERTICAL ALUMINUM
HYDRAULIC SHORING
(STACKED)




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TABLE B - 1 ALUMINUM HYDRAULIC SHORING

WALER SYSTEMS

FOR SOIL TYPE B

DEPTH OF TRENCH (feet)	WALES		HYDRAULIC CYLINDERS			
	VERTICAL SPACING (feet)	SECTION MODULUS (IN (3))	WIDTH OF TRENCH (feet)			
			UP TO 8		OVER 8 UP TO 12	
			HORIZ SPACING	CYLINDER DIAMETER	HORIZ SPACING	CYLINDER DIAMETER
over 5 up to 10	4	3.5	88.0	2 IN	8.0	2 IN*
		7.0	9.0	2 IN	9.0	2 IN*
		14.0	12.0	3 IN	12.0	3 IN*
over 10 up to 15	4	3.5	6.0	2 IN	6.0	2 IN*
		7.0	8.0	3 IN	8.0	3 IN*
		14.0	10.0	3 IN	10.0	3 IN*
over 15 up to 20	4	3.5	5.5	2 IN	53.5	2 IN*
		7.0	6.0	3 IN	6.0	3 IN*
		14.0	9.0	3 IN	9.0	3 IN*
OVER 20	Designed by Registered Professional Engineer					

* Safe working capacity of a 2 inch diameter cylinder must be at least 18,000 pounds; safe working capacity of a 3 inch diameter cylinder must be at least 30,000 pounds; when vertical shores are used, there must be a minimum of three shores spaced equally, horizontally, in a group.


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TABLE B - 1 ALUMINUM HYDRAULIC SHORING

WALER SYSTEMS (using Timber uprights)

FOR SOIL TYPE B

DEPTH OF TRENCH (feet)	WALES		HYDRAULIC CYLINDERS		TIMBER UPRIGHTS		
	VERTICAL SPACING (feet)	SECTION MODULUS (IN (3))	WIDTH OF TRENCH (feet)		MAX. HORIZ SPACING (ON CENTER)		
			OVER 12 UP TO 15		SOLID SHEET	2 FT	3 FT
			HORIZ SPACING	CYLINDER DIAMETER			
over 5 up to 10	4	3.5*	8.0	3 IN*	----	----	3X12
		7.0*	9.0	3 IN*			
		14.0*	12.0	3 IN*			
over 10 up to 15	4	3.5*	6.0	3 IN*	----	3X12	----
		7.0*	8.0	3 IN*			
		14.0*	10.0	3 IN*			
over 15 up to 20	4	3.5*	5.5	3 IN*	3X12	----	----
		7.0*	6.0	3 IN*			
		14.0*	9.0	3 IN*			
OVER 20	Designed by Registered Professional Engineer						

* Consult product manufacturer and/or qualified engineer for Section Modulus of available wales; safe working capacity of a 3 inch diameter cylinder must be at least 30,000 pounds; when vertical shores are used, there must be a minimum of three shores spaced equally, horizontally, in a group.

Aluminum hydraulic shoring - Waler System (using timber uprights)


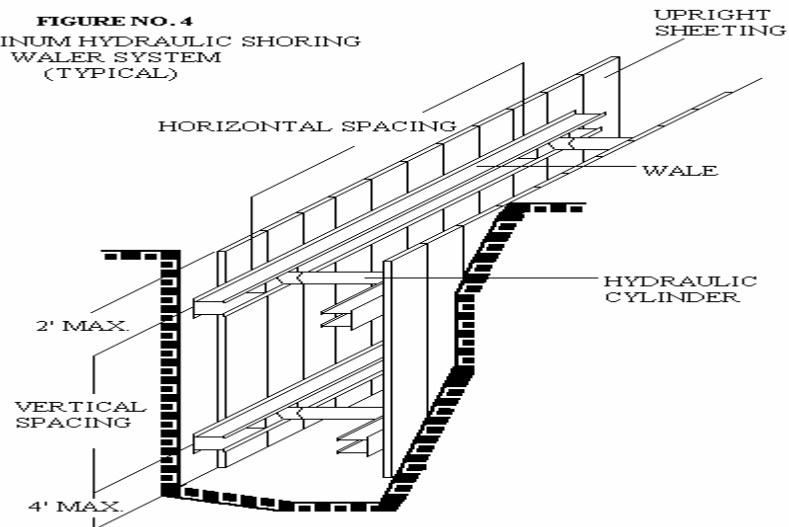
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FIGURE NO. 4
ALUMINUM HYDRAULIC SHORING
WALER SYSTEM
(TYPICAL)




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TABLE B - 1 ALUMINUM HYDRAULIC SHORING

WALER SYSTEMS

FOR SOIL TYPE C

DEPTH OF TRENCH (feet)	WALES		HYDRAULIC CYLINDERS			
	VERTICAL SPACING (feet)	SECTION MODULUS (IN (3))	WIDTH OF TRENCH (feet)			
			UP TO 8		OVER 8 UP TO 12	
			HORIZ SPACING	CYLINDER DIAMETER	HORIZ SPACING	CYLINDER DIAMETER
over 5 up to 10	4	3.5*	6.0	2*	6.0	2 IN*
		7.0*	6.5	2*	6.5	2 IN*
		14.0*	10.0	3*	10.0	3 IN*
over 10 up to 15	4	3.5*	4.0	2*	4.0	2 IN*
		7.0*	5.5	3*	5.5	3 IN*
		14.0*	8.0	3*	8.0	3 IN*
over 15 up to 20	4	3.5*	3.5	2*	3.5	2 IN*
		7.0*	5.0	3*	5.0	3 IN*
		14.0*	6.0	3*	6.0	3 IN*
OVER 20	Designed by Registered Professional Engineer					

* Consult product manufacturer and/or qualified engineer for Section Modulus of available wales; Safe working capacity of a 2 inch diameter cylinder must be at least 18,000 pounds ; safe working capacity of a 3 inch diameter cylinder must be at least 30,000 pounds; when vertical shores are used, there must be a minimum of three shores spaced equally, horizontally, in a group.


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TABLE B - 1 ALUMINUM HYDRAULIC SHORING

WALER SYSTEMS (using timber uprights)

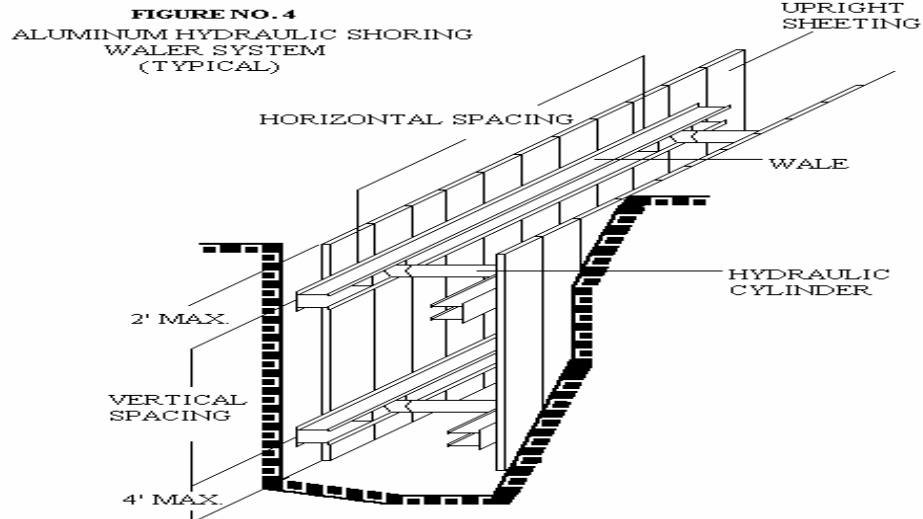
FOR SOIL TYPE C

DEPTH OF TRENCH (feet)	WALES		HYDRAULIC CYLINDERS		TIMBER UPRIGHTS		
	VERTICAL SPACING (feet)	SECTION MODULUS (IN (3))	WIDTH OF TRENCH (FEET)		MAX. HORIZ SPACING (ON CENTER)		
			OVER 12 UP TO 15		SOLID SHEET	2 FT	3 FT
			HORIZ SPACING	CYLINDER DIAMETER			
OVER 5 UP TO 10	4	3.5*	6.0	3 IN*	3X12	----	----
		7.0*	6.5	3 IN*			
		14.0*	10.0	3 IN*			
OVER 10 UP TO 15	4	3.5*	4.0	3 IN*	3X12	----	----
		7.0*	5.5	3 IN*			
		14.0*	8.0	3 IN*			
OVER 15 UP TO 20	4	3.5*	3.5	3 IN*	3X12	----	----
		7.0*	5.0	3 IN*			
		14.0*	6.0	3 IN*			
OVER 20							


* Consult product manufacturer and/or qualified engineer for Section Modulus of available wales; safe working capacity of a 3 inch diameter cylinder must be at least 30,000 pounds; when vertical shores are used, there must be a minimum of three shores spaced equally, horizontally, in a group.

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Aluminum hydraulic shoring - Waler System (using timber



uprights)

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1.0 Policy

All noted equipment shall be operated, maintained, and controlled in a safe manner.

This policy covers minimum performance standards applicable to all ATC Associates employees and locations. Local practices requiring more detailed or stringent rules, or local, state or other federal requirements regarding this subject can and should be added as an addendum to this procedure as applicable.

2.0 Purpose

To define the procedures and standards applying to the care, control, maintenance, inspection, and operation of the noted equipment.

3.0 Scope

All ATC Associates work sites, i.e., ATC offices, client job sites, etc., requiring the use of noted equipment.

4.0 Definitions

Mobile equipment means earthmoving equipment: scrapers, loaders, crawler or wheel tractors, bulldozers, off-highway trucks, graders, agricultural and industrial tractors, backhoes, drill rigs and similar equipment.

Mobile unit means a combination of an aerial device, its vehicle, and related equipment.

Vehicle means any carrier that is not manually propelled.


5.0 Requirements

5.1 General

Only qualified operators designated by Branch Safety Officer or designee shall operate the noted equipment.

Regular preventative maintenance programs shall be established in accordance with regulatory requirements or industry standards for each type of equipment.

Operators of the noted equipment shall be trained in safe operation of the equipment prior to being authorized to operate it. Records of initial and retraining

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shall be maintained. Operators who operate noted equipment on public roadways and any other public property shall hold a valid state drivers license.

Unsafe operators observed shall be prohibited from further equipment operation until retrained.

Persons may only be transported on equipment with designed seating capacity for such persons.

Persons shall not be transported on equipment fenders, buckets, frames, steps, or other means not designed for the movement of people.

Unauthorized persons shall not be transported on equipment even if the equipment is designed for such transport.

Prior to operation, drivers shall inspect their equipment and document accordingly. Basic functions shall be tested prior to actual use of the equipment.

Unsafe conditions or function failure shall be reported to management. Equipment that is unsafe shall not be operated and tagged out of service. A sample Mobile Equipment inspection form is found in Appendix 15-1.

Personal protective equipment (PPE) assessments shall be made for each type of equipment operations and the appropriate PPE provided (reference the PPE section (25) of this manual).


Employees taking prescription medication shall notify their supervisor if the medication warns against operation of machinery/vehicles/equipment. Supervisors shall take necessary actions with this employee and the prescribing physician to provide direction on related work activities.

5.2 Drill Rigs

5.2.1 Drill Rig Inspection

Prior to leaving the ATC drilling shop, the driller must inspect his motor vehicle to determine the condition of the brakes, lights, steering, etc. per Federal DOT regulations. Unsafe motor vehicles, in need of repair, must be taken out of service immediately.

Additionally, the driller must carefully inspect the condition of drilling apparatus (e.g. tools, drive hammer, ropes, etc.). Defective equipment, such as cracked drive hammers, must be taken out of service.

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5.2.2 Drilling Site Preparation

Before entering a drilling site, the drilling crew should conduct a walk-through inspection of the area to determine the location of holes, soft spots, debris, and other obstructions as well as poisonous plants and other hazards that may significantly affect safety at the site.


The site should be cleared of brush, debris, rocks, and other obstructions that may significantly affect safety. Additionally, the site may need to be leveled to safely accommodate the rig.

5.2.3 Safety During Travel

5.2.3.1 Over The Road

When driving a drill rig or pulling a trailer over the road, the vehicle operator must adhere to the following safety procedures:

- 1) The vehicle operator must be properly licensed and should operate the vehicle according to federal, state, and local regulations. Additionally, ATC safe driving procedures must be followed as outlined in the ATC Vehicle Safety and Policy Manual (see section 30).
- 2) Inspect the rig before leaving the shop or project site. **NEVER move a drill rig unless the vehicle brakes are in good working condition.**
- 3) Ensure that materials and tools are well secured on the rig.
- 4) **Know the traveling height, width, and weight of the rig.** Be constantly aware of bridge heights, canopies, low hanging utility lines, trees, etc.
- 5) **Never** travel on a street, road, or highway with the mast (derrick) raised or partially raised.
- 6) **DRIVE DEFENSIVELY!** Maneuver ramps and curves slowly and safely. Allow for safe stopping distances when following other vehicles.
- 7) When towing a trailer, ensure that the hitch and safety chains are secure. Inspect lights and connections.

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- 8) Always be sure bystanders are clear of the vehicle before moving it. Walk completely around the rig to ensure obstructions and people are clear.
- 9) Personnel should never hitch a ride on a moving drill rig.

5.2.3.2 Off-Road Travel


- 1) Before traveling off road, inspect the site for depressions, stumps, gulleys, and other obstructions.
- 2) Discharge passengers before moving a drill rig on rough or hilly terrain.
- 3) Engage the front axle to utilize 4 x 4 capabilities (if applicable).
- 4) When possible, travel uphill or downhill and avoid side-hill movement.
- 5) Attempt to cross obstacles such as small logs and ditches squarely, not at an angle.
- 6) When in position, set brakes and locks on the rig. Block the wheels when grades are steep.
- 7) **Never** travel off road with the mast (derrick) raised or partially raised.

5.2.4 Utilities

Exercise extreme caution when working in close proximity to overhead and underground utilities. Adherence to the following safety procedures will substantially reduce the likelihood of utilities-related injury or death. **NOTE: This section provides a summary of requirements. For a more complete description of requirements refer to section 12 (Electrical Safety), part 5.2.3 and section 33 (Subsurface Investigation Procedures).**

5.2.4.1 Overhead Utilities

- 1) All overhead wires at a site should be considered **alive and dangerous**.

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- 2) Maintain at least **10 FEET** of clearance **in all directions** between the wires and the derrick, rods, or other parts of the rig. If voltage exceeds 50 kV you must maintain more than 10 feet clearance (refer to section 12, Electrical Safety, part 5.2.3). Remember: **Under the right conditions, electricity can arc between the wires and the drill rig.** Allow extra room for swaying of the drill rods and electrical lines such that safe clearance is maintained..
- 3) If drilling must take place within 10 feet of overhead lines, contact the local power company for their assistance. In many instances, they can temporarily shut down the power or insulate the lines. **Plan ahead** for such situations.

If the hole cannot be drilled safely because of overhead lines, DO NOT DRILL THE HOLE!


- 4) Never lift power lines to gain access to the site.

5.2.4.2 Underground Utilities

- 1) Contact the local utilities location service prior to drilling at a site.
- 2) If the exact location of underground utilities cannot be determined by a utilities service, use one or more of the following methods to verify the location:
 - Check with the building owner and refer to building diagrams.
 - Utilize magnetic or other similar detection devices.
 - Hand auger or dig before drilling. Wear electrically insulated protective gloves. Gloves must be rated to (or exceed) the voltage for which they may be exposed. The gloves shall be inspected before use and replaced as per the manufacturer's specifications.

ASSUME THAT THERE ARE UNDERGROUND UTILITIES UNLESS YOU CAN PROVE OTHERWISE!

- 3) Once underground utilities are located, maintain several feet of clearance from the marking. Remember, some conduits or piping can be several feet in diameter.

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5.2.4.3 Contact of Rig with Utilities

If a drill rig does come into contact with overhead or underground utilities, the following procedures should be initiated:

- 1) If in contact with overhead or underground electrical service, **stay clear of the rig**. Immediately contact the utility and emergency personnel.
- 2) If in the rig when in contact with electrical service, remain seated and **do not move**. Do not touch any part of the rig.
- 3) If the driller must get out of the rig because of fire, etc., jump clear of the rig and **do not** hang onto the door when jumping.
- 4) If a worker is being electrocuted, be extremely cautious if a rescue is attempted. **DO NOT BECOME A VICTIM YOURSELF!** Keep as far from the victim as possible and use a non-conductive object to free the individual. Obtain immediate medical attention and initiate first aid.
- 5) If an underground gas line is ruptured, immediately shut down the rig, eliminate sources of ignition, and clear the site. Immediately contact the gas utility and the fire department.

5.2.5 Personal Protective Equipment


5.2.5.1 Clothing

Standard work clothing should be utilized when operating a drill rig. This includes a work shirt and work pants. Shorts are not allowed unless the risk of wearing of long pants (e.g., heat stress) is greater than the risk of wearing shorts (e.g., cuts, abrasions, insect bites and dermatitis associated with exposed legs).

Clothing should not be excessively baggy or have loose threads or fringe, and shirttails must be tucked in at all times. Work gloves with safety cuffs should be worn when handling sharp objects.

5.2.5.2 PPE

Hard hats must be worn by drilling crews and site visitors when working around a drill rig. **NO EXCEPTIONS.**

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Drilling crew members and site visitors must wear safety eyewear when operating a drill rig. Safety glasses and goggles must meet ANSI standards and must be equipped with side shields.

Drilling crew members and site visitors must wear safety footwear with steel toes, steel shanks, and ankle support when at a drilling site. Safety footwear must meet ANSI standards.

Because of the potential for excessive noise from a drill rig, drilling personnel and site visitors must wear appropriate hearing protection (plugs or muffs) when operating a drill rig.

5.2.5.3 Chemical Protective Equipment

Because some sites may include the potential for contamination, special protective clothing may be utilized. This may include protective respirators, boots, gloves, and coveralls which will vary depending upon chemical type.

Only drilling personnel who have received the ATC 40-hour health and safety course are qualified to work on such sites.


5.2.5.4 Fall Protection

When working on the drill rig derrick or on a ladder without three-point contact above six feet in height, suitable fall protection including a full body harness and lanyard **must** be used. Refer to Section 17 (Fall Protection) for specific requirements.

5.2.6 Drill Rig Operation Safety

5.2.6.1 Housekeeping

- 1) Materials, tools, and supplies should be kept off of the ground and in their appropriate storage locations.
- 2) Secure tools, drive hammers, augers, etc. prior to moving the rig on or off site.
- 3) Keep water hoses and catlines coiled and out of the way when not in use.
- 4) Keep platforms and working areas free of ice, mud, spilled lubricants, and excess tools and equipment.

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- 5) Keep engines free of dirt, excessive grease, and oil and spilled fuel.
- 6) Keep drill rods, casings, and other equipment not being used free from dirt and stacked in an orderly manner. Stored equipment should be "blocked" to prevent tilting or rolling.
- 7) Use waste containers to dispose of waste and other trash. Clean work areas at the end of each shift.


5.2.6.2 Tool Safety

A vast number of drilling injuries are directly attributed to the use (or misuse) of hand tools. The following are some basic guidelines to follow when working with tools.

- 1) When using hand tools, especially chisels and hammers, **always** wear appropriate safety eyewear.
- 2) Always use the right tool for the job. A screwdriver is not an appropriate replacement for a chisel. **Make the effort to get the right type and size tool.**
- 3) Keep tools clean and in good condition. Before using any tool, carefully inspect it. If it is damaged, do not use it.
- 4) Keep tools in their storage place when not in use.
- 5) Do not carry tools in pants pockets. Use a tool belt if necessary.
- 6) Never hand carry tools up and down a ladder. Use a tool belt or hoist them up in a bag.
- 7) Do not use excessive pressure or force on any hand tool. **Pull** a tool; **do not push.**

5.2.6.3 Cathead Hoist Safety

Improper use of a cathead hoist can lead to serious injury or death. ATC drilling personnel must abide by the following safety procedures when operating a cathead.

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- 1) The cathead must be clean, rust free, and in good working condition. Rope grooves greater than 1/8 inch warrant cathead replacement.
- 2) The cathead rope must be dry and in good condition. A wet rope will grab on the cathead.
- 3) Keep 18 inches of clearance between the operating hand and the drum. DO NOT wrap the rope around any part of the body.
- 4) Ensure that the rope is not excessively long and is neatly positioned away from the worker's feet.

5.2.6.4 Drive Hammer Safety

- 1) Drilling personnel should **NEVER** place their hand on the rods or drive head when the drive hammer is in operation.
- 2) Prior to each day's work, carefully inspect all parts of the drive hammer. If hairline cracks or imperfections are detected, the hammer should be **permanently** taken out of service.
- 3) Sheave wells, shafts, and pins must be checked daily. They should always be kept well lubricated and should be replaced when worn.

5.2.6.5 Auger Safety

- 1) When drilling, stay clear of rotating augers. Never reach behind or around a rotating auger for any reason.
- 2) Clean augers with a shovel or stick. NEVER clean augers with feet or hands. Also use a shovel to move auger cuttings away from the auger.
- 3) Augers can be extremely heavy and back injuries can result if improperly lifted. If there is any doubt when lifting, get assistance from a fellow employee or a hoist. Always wear gloves and avoid pinch points when carrying augers.
- 4) Stay clear of the backup wrench when unscrewing augers.

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5.2.7 Working with Hazardous Materials

5.2.7.1 Site Hazards

Drilling operations may involve potential exposure to hazardous physical and chemical agents. In these circumstances, precautions such as chemical protective clothing and respirators may be necessary.

The use of such equipment is likely to increase the potential for physical injuries and the onset of heat stress. Therefore, extreme care must be exercised on such projects.

5.2.7.2 Routine Chemicals

Many of the substances used every day as a routine part of drilling (i.e. gasoline, bentonite, etc.) must be handled with care. Material safety data sheets (MSDS) must be maintained on site for all hazardous materials in use.

If using gasoline or other flammables, remember the following basic safety rules:

- 1) NO SMOKING around any gasoline or flammable container.
- 2) Gasoline cans must be approved safety cans, properly labeled, and equipped with flash arresters.

5.2.7.2 Monitoring Hazardous Atmospheres


Any time the surface of the ground is broken, there is a potential for encountering combustible or toxic substances. These commonly may include methane or hydrogen sulfide which could be deadly.

In order to detect hazardous substances before dangerous situations develop, air monitoring may be necessary using equipment and strategies as outlined in Section 23 of this manual.

5.2.8 Emergency Equipment

At a minimum, the following emergency equipment must be accessible at each drilling site. NO EXCEPTIONS!

- 1) A,B,C-rated fire extinguisher

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- 2) First aid kit
- 3) Traffic cones or reflective traffic triangles
- 4) Emergency phone numbers

5.3 Hoists (overhead)

The safe working load of the overhead hoist, as determined by the manufacturer, shall be indicated on the hoist, and this safe working load shall not be exceeded.

The supporting structure to which the hoist is attached shall have a safe working load equal to that of the hoist.

The support shall be arranged so as to provide for free movement of the hoist and shall not restrict the hoist from lining itself up with the load.

The hoist shall be installed only in locations that will permit the operator to stand clear of the load at all times.

Air hoists shall be connected to an air supply of sufficient capacity and pressure to safely operate the hoist. Air hoses supplying air shall be positively connected to prevent their becoming disconnected during use.


Overhead hoists in use shall meet the applicable requirements for construction, design, installation, testing, inspection, maintenance, and operation, as prescribed by the manufacturer.

Prior to using the crane/hoist, the operator shall do a visual inspection to confirm the safety of this equipment. This includes a check of the wire rope, chain, sling(s), hook(s) and other components.

5.4 Mobile Equipment

Mobile equipment shall have operating:

- braking system(s)
- taillights
- brake lights
- wipers for front windows
- seat belt restraint systems
- head lights (when operated in low light or at night)

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- reflective devices to warn of their presence in accordance with 'Highway' standards
- horn
- (for construction sites only) backup alarms when visibility to the rear is obstructed

Mobile equipment (not normally operated on public highways or roadways) shall display a 'slow-moving equipment' symbol when traveling on them, and be operated in accordance with local and state highway regulations.

Operators shall wear seat belts while operating mobile equipment.


Material, tools, and other objects shall not be transported in the cab of mobile equipment.

Personnel are not permitted to ride:

- in mobile equipment cabs with operators (except during training exercises or when such equipment is designed and equipped by the manufacturer for additional riders)
- in buckets
- on fenders
- on running boards
- on forklifts
- any other part of mobile equipment
- on any load being transported by mobile equipment

Mobile equipment shall be inspected at the beginning of each shift in which the equipment will be used, to assure that parts, equipment, and accessories are in safe operating condition and free of apparent damage that could cause failure while in use. In addition to daily inspections there shall be a documented inspection once per month that includes as applicable:

- Service brakes, including trailer brake connections
- Parking system (hand brake)
- Emergency stopping system (brakes)
- Tires
- Horn
- Steering mechanism
- Coupling devices
- Seat belts
- Operating controls

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- Safety devices
- Window and cab glass
- Power window wipers
- Defogging and defrosting equipment
- Hydraulics for leaks
- Back-up alarms
- Fire extinguishers

Defects that affect the safe operation of equipment shall be corrected before the unit is placed in service.

Only qualified personnel shall repair mobile equipment.

A safety tire rack, cage, or equivalent protection shall be provided and used when inflating, mounting, or dismounting tires installed on split rims, or rims equipped with locking rings or similar devices. A remote wand shall be used to inflate tires that are mounted on rims on operational vehicles if they are equipped with split rims. No employee shall be allowed to be in front of the rim during this process.


When performing maintenance and/or repairs on movable parts of mobile equipment such as hydraulic rams, dump beds, buckets that create a pinch point shall be blocked, de-energized, cribbed or otherwise immobilized by other such activity (reference Energy Control (lockout) section (14) of this manual).

Bulldozer and scraper blades, end-loader buckets, dump bodies, and similar equipment, shall be either fully lowered or blocked when being repaired or when not in use. All controls shall be in a neutral position, with the motors stopped and brakes set, unless work being performed requires otherwise.

Whenever mobile equipment is parked, the parking brake shall be set. Such equipment parked on inclines shall have the wheels chocked and the parking brake set.

During fueling operations the engine of mobile equipment shall be turned off, movable parts such as dozer blades, and buckets shall be lowered to the ground.

Mobile equipment fueled with gasoline shall not be operated in enclosed areas such as buildings unless there is adequate ventilation and continuous monitoring for toxic gases such as carbon monoxide. Mobile equipment fueled with "diesel" shall have an approved scrubber in good working condition.

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Mobile equipment fueled with compressed gas within enclosed areas shall be operated in accordance with manufacturers specifications.

The use, care and charging of mobile equipment using batteries shall be in accordance with manufacturers specifications (reference Electrical-General section (12) of this manual).

Cab glass shall be safety glass, or equivalent, that introduces no visible distortion affecting the safe operation of any mobile equipment. Glass that is cracked or broken shall be replaced before the affected mobile equipment is operated. When window glass is subject to conditions that cause fogging or frosting the windshields shall be equipped with operable defogging or defrosting devices.

Combustible and flammable materials shall be removed from the immediate area prior to operations.

The operation of mobile equipment near energized electrical power lines shall conform to section 5.2.3 of the Electrical-General section (12) of this policy manual.


A person shall be designated to observe clearance of the equipment and give timely warning for operations where it is difficult for the operator to maintain the desired clearance by visual means.

Cage-type boom guards, insulating links, or proximity warning devices may be used on cranes, but the use of such devices shall not alter the requirements of any other regulation of this part even if such device is required by law or regulation.

Any overhead wire shall be considered to be an energized line unless and until the person owning such line or the electrical utility authorities indicate that it is not an energized line and/or it has been visibly grounded.

Prior to work near transmitter towers where an electrical charge can be induced in the equipment or materials being handled, the transmitter shall be de-energized or tests shall be made to determine if electrical charge is induced on the crane. The following precautions shall be taken when necessary to dissipate induced voltages.

The equipment shall be provided with an electrical ground directly to the upper rotating structure supporting the boom; and ground jumper cables shall be attached to materials being handled by boom equipment when electrical charge is induced while working near energized transmitters. Employees shall be

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provided with nonconductive poles having large alligator clips or other similar protection to attach the ground cable to the load.

Haulage vehicles, whose payload is loaded by means of cranes, power shovels, loaders, or similar equipment, shall have a cab shield and/or canopy adequate to protect the operator from shifting or falling materials.

Personnel shall only ride in compartments designed for occupancy. These areas shall have a firmly attached seat and seat belt for each occupant. Seat belts and anchorages meeting the requirements of 49 CFR part 571 (Department of Transportation, Federal Motor Vehicle Safety Standards) shall be installed in all motor vehicles.

Trucks with dump bodies shall be equipped with positive means of support, permanently attached, and capable of being locked in position to prevent accidental lowering of the body while maintenance or inspection work is being done.

Operating levers controlling hoisting or dumping devices on haulage bodies shall be equipped with a latch or other device which will prevent accidental starting or tripping of the mechanism.

Trip handles for tailgates of dump trucks shall be so arranged that, in dumping, the operator will be in the clear.

6.0 REFERENCES

OSHA 29 CFR 1910 Subparts F and N

OSHA 29 CFR 1926 Subparts H, N, O, and W



Appendix 15-1

Mobile Equipment Inspection Record

Type Equipment: _____ Unit No. _____

Location: _____ Project No. _____

Inspected by: _____ Date: _____


Indicate by initialing "Yes" if item checked is adequate is operational, and safe. Initial "No" to indicate repair or other action is required. Use NA to indicate "Not applicable".

Item to be checked		YES	NO	NA
a.	Fuel level			
b.	Engine oil level			
c.	Engine water level			
d.	Hydraulic system, fluid level, visible leaks			
e.	Battery, water level, condition, state of charge			
f.	Fire extinguisher (if applicable)			
g.	Seat belt			
h.	Load chart, in place, legible			
i.	Lights, turn signals			
j.	Horn and backup alarm functional			
k.	Tires, proper inflation, condition			
l.	Windshield, clean, unbroken, wipers functional			
m.	Pins and bushings, condition, lubricated			
n.	Cable and drum, condition			
o.	Block/Ball and hook, safety latch, condition			
p.	Cable guides			
q.	Auger motor and linkage			
Start the engine and check the following:				
a.	Steering acceptable			
b.	Brakes functional			
c.	All gauges operational			
Check the following from the operator's position:				
a.	Verify outriggers functional			
b.	Verify load line functional			
c.	Verify boom functional, all motions			
d.	Verify auger functional, all speeds			

Note defects found must be repaired prior to equipment use. On completion of inspection, retain this form with the equipment till the end of the workday. Then turn in to immediate supervision for filing.

Signature of Person Completing Repairs

Date Repaired

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1.0 Policy

All ATC Associates (ATC) project activities associated with energized equipment or processes shall have all energy systems controlled prior to working on, in, or removing guards from a piece of equipment.

This policy covers minimum performance standards applicable to all ATC employees and locations. Local practices requiring more detailed or stringent rules or local, State or Federal requirements regarding this subject can and should be added as an addendum to this procedure as applicable.

2.0 Purpose

To identify and establish safe practices for equipment, machines, or processes that involve hazardous energy sources.

3.0 Scope


Applies to all ATC work sites, i.e., ATC offices, client job sites, etc., that perform activities such as, but not limited to, erecting, installing, constructing, repairing, adjusting, inspecting, cleaning, operating or maintaining equipment or machines whereby hazardous energy sources are involved.

NOTE: Special exception to policy: Equipment or machines that have an electrical plug as the sole hazardous energy source and can reach a zero energy state by simply being unplugged are exempt from this policy, as long as control of the plug can be maintained at all times by the employee performing the work.

4.0 Definitions

Affected Employee – means an employee whose job requires them to operate or use a machine or equipment on which servicing or maintenance is being performed under lockout or tagout, or whose job requires them to work in an area in which such servicing or maintenance is being performed.

Authorized Employee – means a person who locks out or tags out machines or equipment in order to perform servicing or maintenance on that machine or equipment. An Affected Employee becomes an Authorized Employee when that employee's duties include performing servicing or maintenance covered under this Policy. Additionally, any ATC Authorized Employee must have received all training required by this Policy.

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Control Mechanism - means any lock or combination of locks, multi-lock hasps and/or other types of special mechanisms (chains, valve covers, breaker covers, etc.) applied to an energy-isolating device to ensure that it cannot be moved or operated.

Energized – means connected to an energy source or containing residual or stored energy.

Energy Control Device - means a mechanical device that physically prevents the transmission or release of hazardous energy, including, but not limited to the following: a manually operated electrical circuit breaker; a disconnect switch; line valve; slide gate; or similar device used to block or isolate energy.

Hazardous Energy Source - means any type of energy that could injure anyone working on or near the equipment, machine or process if released as a result of work activities. Examples of hazardous energy sources include, but are not limited to the following: electrical; hydraulic (fluid/liquids); pneumatic (air); chemical; radiation; thermal; mechanical (from stored energy, such as in flywheels and springs); and mechanical (from gravity).

Lockout (LO) - means the placement of a control mechanism on an energy-isolating device that ensures that the equipment/machine/process being worked on cannot be operated or initiated until the control mechanism is removed.


Multi-Lock Hasp - means a device that is placed on a single energy isolation device, but that allows for the use of multiple individual locks. The multi-lock hasp stays in place and cannot be removed until the final lock is removed.

Other Personnel - means non-ATC personnel or visitors to any work area where ATC Authorized Employees are utilizing processes outlined in this Policy.

Operation Device - means any switch, button, lever, valve, etc. that is expressly intended for the starting or initiation of the equipment, machine or process.

Servicing and/or maintenance. – means workplace activities such as constructing, installing, setting up, adjusting, inspecting, modifying, and maintaining and/or servicing machines or equipment. These activities include lubrication, cleaning or un-jamming of machines or equipment and making adjustments or tool changes, where the employee may be exposed to the unexpected energization or startup of the equipment or release of hazardous energy

Tag – means the standardized tag utilizing the OSHA red, white, and black colors for “Danger”, and the text “Do Not Operate” or equivalent. A tag is designed to communicate the lockout process, the reason for the particular lockout, and the

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person(s) directly involved. It is preferred that “Do Not Operate” tags be used at all times in conjunction with a lockout as a means to provide additional warning of the hazard.

Tagout (TO) – means the placement of a tagout device on an energy isolating device, in accordance with an established procedure, to indicate that the energy isolating device and the equipment being controlled may not be operated until the tagout device is removed.

Zero Energy State means the equipment, machine, or process has been purged of or blocked from hazardous energy sources, that is, there is no hazardous energy present.

5.0 Requirements

5.1 Priority of Control Mechanism

When determining control methods for hazardous energy sources the first priority is for a lockout device to be used. Lockout devices can only be removed by the individual applying the device and therefore can prevent someone else from removing the device and starting the piece of equipment or machine while service or maintenance is still being performed.

If a piece of equipment, machine, or process is incapable of being locked out, then a tagout device may be used. All tagout devices shall contain, at a minimum, the following:


- Minimum unlocking strength of no less than 50 pounds
- Text indicating “Do Not Operate”, or equivalents such as Do Not Open, Do Not Close, or Do Not Energize displayed on the tag.

All tags must meet OSHA requirements for “DANGER” signage in style and color.

5.2 Identifying Applicable Equipment, Machines or Processes

The following shall be documented and identified by each ATC Branch:

- Any owned or leased equipment, machine, or process where this Policy applies.
- Applicable procedures related to the identified equipment, machine, or process.
- Applicable lockout mechanisms necessary for energy control procedures related to the identified equipment, machine or processes.

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- Any routine task(s) and job description(s) that involve the use of energy control procedures or which may be affected by energy control devices.

This information shall be developed by the Branch Safety Officer, posted on or near the machine and kept on file. This information will be utilized within the training required for Authorized Employees, and updated as equipment, machines, or processes and lockout mechanisms are introduced. A sample format is found in Appendix 14-01 (Energy Control Identification Form).

5.3 Training


5.3.1 Initial Training

Prior to being exposed to areas with equipment, machines, or processes requiring or using energy control devices, each Affected Employee shall receive training on the contents of this Policy. Training will also include information on the importance of energy control and recognition of its use.

Each Authorized Employee shall receive the same training as an Affected Employee. Additional training will include special training in the recognition of hazardous energy sources, the specific procedures on each piece of equipment, machine, or process within their respective work areas that require energy control, types of necessary control mechanisms, and the procedures of this Policy.

If a tagout system is used, then all Authorized and Affected Employees shall be trained on the limitation of the tag system including:

- Tags are essentially warning devices affixed to energy isolating devices, and do not provide the physical restraint on those devices that is provided by a lock.
- When a tag is attached to an energy isolating means, it is not to be removed without authorization of the Authorized Employee responsible for it, and it is never to be bypassed, ignored, or otherwise defeated.
- Tags must be legible and understandable by all Authorized Employees, Affected Employees, and all other employees whose work operations are or may be in the area, in order to be effective.
- Tags and their means of attachment must be made of materials which will withstand the environmental conditions encountered in the workplace.

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- Tags may evoke a false sense of security, and their meaning needs to be understood as part of the overall Energy Control Program.
- Tags must be securely attached to energy isolating devices so that they cannot be inadvertently detached during use.

5.3.2 Annual Refresher Training

Both Affected and Authorized Employees shall receive annual re-training of the same nature identified in this Policy. For Authorized Employees annual retraining must include demonstration of the current procedures to ensure procedures are known and provide sufficient protection from hazardous energy sources.

5.3.3 Other Re-training

Any Affected or Authorized Employee shall be immediately re-trained if their actions during related work activities violated any portion of this Policy, or if a new piece of equipment, machine, or process is introduced or if a current Energy Control procedure is modified.

5.4 Development of Lockout Procedures

After a Branch has identified equipment, machines, or processes that require energy control during the maintenance or servicing operations, a detailed procedure on how to eliminate or isolate the hazardous energy source must be developed.


All procedures should be written in such a way as to provide detail to all Authorized Employees on the proper and safe way to perform the work. Each set of procedures must outline the scope, purpose, authorization, rules and techniques that will be used by Authorized Employees. Not all equipment, machines, or processes require a separate procedure. Similar machines which have the same type of controls and sources of hazardous energy may have the same procedures.

An example of a specific Energy Control Procedure can be found in Appendix 14-02.

5.5 Emergency Energy Control Mechanism Removal Procedures

Every effort shall be made to personally contact the Authorized Employee whose energy control device needs to be removed prior to following the procedures outlined in this Policy.

The direct Supervisor of an Authorized Employee is the first person allowed to remove their lock. If the applicable Supervisor is not physically capable, only

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another Authorized Employee can be provided with the authority, directly by the applicable Supervisor only.

In either event, the direct Supervisor of the Authorized Employee who originally placed the lockout mechanism(s) to be removed shall inform that employee of the removal BEFORE that employee returns to that work area. This communication shall be documented on the Lock Removal Procedure Form (Appendix 14-03). Messages (oral, written, or forwarded) are prohibited.

Appendix 14-3 (Removal Procedure) shall be utilized for documentation.

5.6 Energy Control Mechanisms

5.6.1 Locks

Each Authorized Employee shall be issued a lock (or locks) individually keyed and manufactured of a standard size, shape and/or color. Each Branch shall identify this as a Branch Addendum to this Policy.


Locks for the Energy Control Program shall have no other use but for the control of hazardous energy (Lockout).

Each Branch shall create a list of employees and corresponding lock numbers maintained at the work site. Such lists shall be maintained by the Branch Safety Officer or designee.

5.6.2 Multi-lock Hasps

The following steps shall be followed to accommodate multiple Authorized Employees on a single project:

- A multi-lock hasp shall be utilized when more than one Authorized Employee is performing work on the equipment, machine, or process.
- The senior ATC Authorized Employee working on the specific project shall be responsible for assuring that other Authorized Employees working on the project attach their personal lockout device prior to work being performed.
- The senior ATC Authorized Employee working on the specific project shall also be responsible for assuring the continuity of the lockout device during shift changes and/or personnel changes unless formally relieved of that responsibility by the Project Manager. At that time, the Project Manager will obtain the responsibility for the integrity of the lockout device.

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- When a traditional multi-lock hasp will not provide enough attachment points for Authorized Employees, another method shall be established (e.g. adding another multi-lock hasp, lockout box, lockout cabinet, etc.) as per the direction of the senior ATC Authorized Employee working on the specific project.

5.6.3 Do Not Operate Tags

Tags (when necessary) shall be durable, standardized in type, and have areas to indicate the employee's name and contact information. The use of these tags shall be established in a Branch Addendum to this Policy.

5.7 Multi-Contractor or Client Sites

ATC Authorized Employees shall inform the Supervisor of other employers in a multi-employer work site of all aspects covered by this Policy.

In situations where ATC employees are performing work on a Client's property and the scope of work includes the need to work on, work in, or work around a piece of equipment, machine, or process, the ATC Project Manager should inform the Client representative of the need for assistance on controlling the hazardous energy sources of the equipment, machine, or process. The on-site ATC employee should work with an Authorized Client Employee to safely control the sources of hazardous energy. The ATC employee should apply a control mechanism to all appropriate areas and verify that the hazardous energy sources have been controlled prior to performing work on the equipment, machine, or process.


In the event that the Client has not developed specific procedures on how to safely isolate the hazardous energy source of a piece of equipment, machine, or process, work must not continue until ATC, working with the Client, can develop safe Energy Control Procedures.

5.8 Policy Review and Certification

Annually, applicable addendums and related training programs) shall be reviewed and documented (certified) by the Branch Safety Officer for updating and verifying the use of these procedures. Inspections verifying that these procedures are being followed shall be a component of this review.

5.8.1 Periodic Inspection by Branch

At least annually, the Branch shall ensure that an Authorized Employee (other than the ones utilizing the Energy Control Procedure being

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inspected) inspects and verifies the effectiveness of the Energy Control Procedures used at the Branch.

These periodic inspections shall observe the Energy Control Procedures in use and may occur during random audits or planned audits. These inspections are intended to ensure that the Energy Control Procedures are being properly implemented and to provide an essential check on the continued utilization of the procedures.

When lockout devices are used, the Branch's inspection shall include a review of the procedures with each Authorized Employee observed performing the procedures. Group meetings between the Authorized Employee performing the inspection and all Authorized Employees who perform the Energy Control Procedure would constitute compliance with this requirement.

When tagout devices only are used at the Branch, the Branch shall conduct this annual review of the Energy Control Procedures with each Affected and Authorized Employee.

Energy Control Procedures used less frequently (less than once per year) need to be inspected only when used.


The periodic inspection must provide for and ensure effective correction of identified deficiencies. The Branch is required to document that the prescribed periodic inspections have been performed.

5.9 ATC Subcontractors

Subcontractors for ATC Associates are required to meet or exceed all aspects covered by this Policy.

6.0 Appendices

- 14-01** - Energy Control Identification Form
- 14-02** - Example of a Specific Energy Control Procedure
- 14-03** - Removal Procedure
- 14-04** - Lockout/Tagout Isolation Record
- 14-05** – Examples of Energy Control Equipment

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7.0 References

- Occupational Safety and Health Administration (OSHA), 29CFR1910.147 – The Control of Hazardous Energy (lockout/tagout).
- Occupational Safety and Health Administration (OSHA), 29CFR1926.417 – Lockout and Tagging of Circuits.



Appendix 14-01

Energy Control Identification Form

Branch: _____

Date: _____

Person Completing This Form: _____

Location, Name of Equipment, and Type of Energy Sources



Appendix 14-02 Example Energy Control Procedure

Hazardous Energy Control

An important component of any health and safety plan is protecting employees from inadvertent startup of equipment while employees are working on that equipment. The process to protect employees is often referred to as Lockout/Tagout or LO/TO. Appendix 14-04 Lockout/Tagout Isolation Record must be filled out every time lockout or tagout is used.

The following is a sample list of equipment that must have lockout tagout used when maintenance or repair is being conducted:

- Gas fired thermo oxidizing unit
- Electrical catalytic oxidation unit
- Air sparge unit
- Dual phase extraction unit

Types of energy:

- Compressed air
- Electrical
- Gas

Routine tasks that require energy control:

- Grease Blower
- Check or replace belts
- Changing oil
- Repairing electrical outlet
- Changing gas valve
- Repairing gas leak
- Changing gas actuator valve
- Working on control panel
- Changing Starter

The following are lockout procedures to be followed when performing maintenance or repair on the equipment listed above. As a reminder only Authorized Employees may perform lockout/tagout procedures.

(1) Control Panel Lockout – For activities such as: Grease Blower; Check or replace belts; or Changing Oil.

Procedures for Control Panel Lockout:

1. All Authorized Employees scheduled to lockout the equipment must verbally warn all Affected Employees of activities.
2. Obtain lockout device and “Do Not Operate” tag.
3. Shut down the equipment following normal procedures.
4. On the control panel move the panel power disconnect to the “OFF” position.

Appendix 14-02 Example Energy Control Procedure



Shutting down the equipment at the control panel (turn to the “OFF” position).

5. Where more than one person is potentially involved in activities, apply a multi-lock “Hasp” that allows for one or multiple locks to be applied.
6. All Authorized Employee working on the equipment must place their locks on the panel power disconnect (or multi-lock hasp).



Equipment is locked out in the “OFF” position.

NOTE: It is preferable that a standard “DANGER – DO NOT OPERATE” tag be applied that has details of why equipment is locked-out and who is involved in the work. This helps communicate what is happening.

7. To ensure the equipment is safe to work on, and only after all Affected Employees are aware of the activity, attempt start-up of the equipment following the normal operating procedures. This action should remove any excess energy and confirm that the equipment is completely locked out.
8. Perform maintenance or repair activities.
9. When all maintenance and repair activities are completed remove all tools from the work area and replace any guards that were removed.
10. Communicate to all Affected Employees that equipment will be placed back into service.
11. Remove your personal lock and Do Not Operate tag. Do not remove another employee’s lock or tag.
12. After all employees remove their locks, and assuring that equipment is ready for start-up, start up the equipment following normal procedures.

(2) Circuit Breaker Lockout – For activities such as: Grease Blower; Changing Oil; Belt Changes; Control Panel Work; Electrical Work; or Changing Starter.

Procedures for Circuit Breaker Lockout:

1. All Authorized Employees scheduled to lockout the equipment must verbally warn all Affected Employees.
2. Obtain lockout device.
3. Shut down the equipment following normal procedures.
4. Open the circuit breaker box

Appendix 14-02 Example Energy Control Procedure



5. Move the appropriate breaker from the “ON” position to the “OFF” position.
6. Place the lockout device and tag on the breaker and physically check that the breaker does not move.



**Example of multi-lock hasp being
used for attachment of locks.**

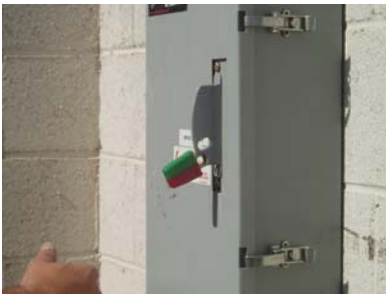
7. To ensure the equipment is safe to work on, attempt to start-up the equipment following the normal operating procedures. This action should remove any excess energy and show that the equipment is completely locked out.
8. Perform maintenance or repair activities.
9. When all maintenance and repair activities are completed remove all tools from the work area and replace any guards that were removed.
10. Notify all Affected Employees that equipment will be re-energized.
11. Remove personal lock and tag. Do not remove another employee's lock or tag.
12. Start up the equipment following normal procedures.

Appendix 14-02 Example Energy Control Procedure

(3) Air Sparge Lockout - For activities such as: Working on or replacing unit.

Procedures for Air Sparge Lockout:

1. All Authorized Employees scheduled to lockout the equipment must verbally warn all Affected Employees.
2. Obtain lockout device and tag.
3. Shut down the equipment following normal procedures.
4. Move the lever to the “OFF” position and place your lock on the lever, locking the lever in the off position. Place tag at lock area.



**Equipment is locked out in the
“OFF” position.**

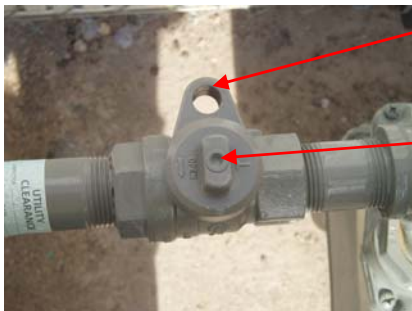
5. To ensure the equipment is safe to work on, attempt to start-up the equipment following the normal operating procedures. This action should remove any excess energy and confirm that the equipment is completely locked out.
6. Perform maintenance or repair activities.
7. When all maintenance and repair activities are completed remove all tools from the work area and replace any guards that were removed.
8. Remove personal lock and tag only. Do not remove another employee's lock or tag.
9. Notify all Affected Employees that system will be re-energized.
10. Start up the equipment following normal procedures.

(4) Gas Line Lockout: For activities such as: Gauge replacement; Gas lead repair.

Appendix 14-02 Example Energy Control Procedure

Procedures for Gas Line Lockout:

1. All Authorized Employees scheduled to lockout the equipment must verbally warn all Affected Employees.
2. Obtain lockout device and tag.
3. Shut down the equipment following normal procedures.
4. Turn the valve to the “OFF” position on the house side of gas meter.



When gas valve is in the “OFF” position, holes align to accept locking device.

Gas valve is in the “OFF” position.

5. Place lock and tag on the valve and check to make sure it is in place



6. To ensure the equipment is safe to work on, attempt to start-up the equipment following the normal operating procedures.
7. This action should remove any excess energy and gas.

Appendix 14-02 Example Energy Control Procedure

8. When all maintenance and repair activities are completed remove all tools from the work area and replace any guards that were removed.
9. Notify all Affected Employees that system will be re-energized
10. Remove lock. Do not remove another employee's lock.
11. Start up the equipment following normal procedures.

(4) Gas & Electric Lockout: For activities such as: Gas actuator valve replacement.

Procedures for Gas & Electric Lockout:

1. All Authorized Employees scheduled to lockout the equipment must verbally warn all Affected Employees.
2. Obtain lockout device and tag.
3. Shut down the equipment following normal procedures.
4. Turn the valve to the "OFF" position on the house side of gas meter.



5. Place a lock on the valve and check to make sure it is in place
6. To ensure the equipment is safe to work on, attempt to start-up the equipment following the normal operating procedures.
7. This action should remove any excess energy and gas.
8. Open the circuit breaker box
9. Move the appropriate breaker from the "ON" position to the "OFF" position.
10. Place the lockout device and tag on the breaker and physically check that the breaker does not move.



11. To ensure the equipment is safe to work on, attempt to start-up the equipment following the normal operating procedures. This action should remove any excess energy and show that the equipment is completely locked out.
12. Perform maintenance or repair activities.
13. When all maintenance and repair activities are completed remove all tools from the work area and replace any guards that were removed.
14. Notify all Affected Employees that system will be re-energized.

Appendix 14-02
Example Energy Control Procedure

15. Remove personal lock and tag. Do not remove another employee's loc or tag.
16. Start up the equipment following normal procedures.

List of Authorized Employees:

Brad Parker
Louie Hiltunen
John Bloom
John Manley
Lamar Davis
Dustin Davis
Dan Mickelsen



Appendix 14-03
Lock Removal Procedure Form

Equipment/Machine/Process: _____
Lock Number: _____
Authorized Employee Name: _____
Location: _____

Consistent with ATC Policy No. 14 Energy Control (Lockout), only the direct Supervisor of an Authorized Employee shall remove an Energy Control Device (Lock) after all efforts have been made to assure the area in question is clear, the Authorized Employee is not available to remove the lock themselves and this Procedure has been completed.

Check each item that applies and sign prior to Energy Control Device Removal

- ☐ It is absolutely necessary that the equipment/machine/process be re-engaged before the authorized employee can return to personally remove the lock.
- ☐ Every attempt has been made to locate the Authorized Employee so they can remove their Energy Control Device (Lock).
- ☐ The direct Supervisor of the Authorized Employee or a direct designee has personally reviewed the equipment/machine/process to assure the area is clear of people, tools or obstructions.
- ☐ The Energy Control Device (Lock) will be removed by the Authorized Employee's direct Supervisor or a direct designee only.

Direct Supervisor or (direct) Designee

Date of Removal

- ☐ The Authorized Employee acknowledges the lock removal.

Authorized Employee
(whose lock was removed)

Date

Direct Supervisor or (direct) Designee

Date

Appendix 14-04

Lockout/Tagout Isolation Record

System:		Isolation Record				Status		Tagging Authority	
Equipment Tag:		Equipment Description:				<input type="checkbox"/> Construction			
						<input type="checkbox"/> Startup			
						<input type="checkbox"/> Operations			
LOTO No.	DNO Tag No.	Equipment Tag No.	Equipment Description	Pos.	LOTO Placed By:	Date	LOTO Removed BY:	Date	
Tagging Authority Approval:									
		Signature				Date			
Holder List:									
PTW No.	Signed Onto LOTO Name			Date / Time	Signed Off LOTO Name			Date / Time	

Appendix 14-05
Examples of Energy Control Equipment



Do Not Operate Tags




Multi-Lock Hasps



**Cover for Locking-Out
Valve Wheel**



**Locks on Multi-Lock
Hasp**

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1.0 Policy

Work activities involving electrical hazards shall be conducted safely.

This policy covers minimum performance standards applicable to all ATC Associates employees and locations. Local practices requiring more detailed or stringent rules, or local, state or other federal requirements regarding this subject can and should be added as an addendum to this procedure as applicable.

2.0 Purpose

To establish the procedures that shall be followed in the safe performance of work activities involving general electrical hazards.

3.0 Scope

Applies to all ATC Associates work sites, i.e., ATC offices, client job sites, etc.

4.0 Definitions

Approved - means acceptable to the authorities.

Authorized Person - means a person approved or assigned by ATC Associates to perform a specific duty or duties or to be at a specific location or locations at the jobsite.

Cabinet means an enclosure designed either for surface or flush mounting.

Competent Person - means one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has the authorization to take prompt corrective measures to eliminate them.

Conductor (bare) - means a conductor having no covering or electrical insulation whatsoever.


Conductor (insulated)- means a conductor encased within material of composition and thickness that is recognized as electrical insulation.

Defect - means any characteristic or condition that tends to weaken or reduce the strength of the tool, object, or structure of which it is a part.

Disconnect - means a device, or group of devices, or other means by which the conductors of a circuit can be disconnected from their source of supply.

Enclosed - means surrounded by a case, housing, fence or walls which shall prevent persons from accidentally contacting energized parts.

Enclosure - means the case or housing of apparatus, or the fence or walls surrounding an installation to prevent personnel from accidentally contacting energized parts, or to protect the equipment from physical damage.

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Exposed (as applied to live parts) - means capable of being inadvertently touched or approached nearer than a safe distance by a person. It is applied to parts not suitably guarded, isolated, or insulated.

Guarded - means covered, shielded, fenced, enclosed, or otherwise protected by means of suitable covers, casings, barriers, rails, screens, mats, or platforms to remove the likelihood of approach to a point of danger or contact by persons or objects.

Isolated- means not readily accessible to persons unless special means for access are used.

Labeled - means equipment or materials to which has been attached a label, symbol or other identifying mark of a qualified testing laboratory which indicates compliance with appropriate standards or performance in a specified manner.

NEC - stands for National Electric Code.

Qualified - means persons who are capable of working safely on equipment and are familiar with electrical properties, the proper use of special precautionary techniques, personal protective equipment, insulating and shielding materials, and insulated tools.

Receptacle - means a contact device installed at the outlet for the connection of a single attachment plug. A single receptacle is a single contact device with no other contact device on the same yoke. A multiple receptacle is a single device containing two or more receptacles.

5.0 Requirements


5.1 General

Feasible engineering and administrative controls shall be applied to mitigate or minimize the risk of injury and illness from exposure to electrical hazards. Where such hazards still exist after application of these controls, local 'hot work' procedures (see local addendum to this section) shall apply and personal protective equipment shall be utilized. Such addenda shall comply with NFPA 70E.

Where feasible, employees shall not perform live electrical work. Branches that engage in live work are required to provide applicable safe work procedures, PPE, and equipment in Addendum to this Manual section.

In existing installations, no changes in circuit protection shall be made to increase the load in excess of the load rating of the circuit wiring.

Worn or frayed electric cords or cables shall be removed from work areas for repair or disposal. Plugs equipped with a grounding prong must have the prong in place. Damaged plugs must be repaired. Repairing cords shall be limited to

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shortening only by an authorized person, as determined by the Branch Safety Officer.

Working spaces, walkways, and similar locations must be kept clear of cords to eliminate hazards.

Extension cords shall not be fastened with staples, hung from nails, or suspended by wire.

Control equipment, utilization equipment, and busways approved for use in dry locations only shall be protected against damage from the weather during building construction.

Metal raceways, cable armor, boxes, cable sheathing, cabinets, elbows, couplings, fittings, supports, and support hardware shall be of materials appropriate for the environment in which they are to be installed.

Electrical switches shall be labeled to indicate the system, equipment, service, or tool they control. This includes switch boxes, cabinets, motor control cabinets, stationary equipment, control panels, and other such switches or disconnects.


Persons who perform electrical work shall wear hard hats that are proof tested to 20,000 volts and shall not wear clothing with or without PPE that could increase injury (100% cotton is better than blended materials).

In work areas where the exact location of underground electric power lines is unknown, employees using jackhammers, bars, or other hand tools that may contact a line shall be provided with insulated protective gloves. Gloves must be rated to (or exceed) the voltage for which they may be exposed. The gloves shall be inspected before use and replaced as per the manufacturer's specifications.

Wiring components and equipment in hazardous environments shall be maintained in a condition consistent with NEC requirements (e.g. no loose or missing screws, gaskets, threaded connections, seals, or other impairments to a tight condition).

Hazardous locations are those locations where flammable vapors, liquids or gases, or combustible dusts or fibers may be present. There are six "classifications" for these types of locations, as follows:

- **Class I Division 1 and Division 2**
- **Class II Division 1 and Division 2**
- **Class III Division 1 and Division 2**

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Equipment, wiring methods, and installations of electrical equipment in hazardous (classified) locations must be designated as "intrinsically safe" or be approved for the classification location.

5.2 Employee Training

5.2.1 Qualified Person

A qualified person shall be trained and knowledgeable of the construction and operation of equipment or a specific work method and be trained to recognize and avoid the electrical hazards that might be present with respect the equipment they will be working with. A qualified person shall also be familiar with the proper use of the special precautionary techniques, personal protective equipment, insulated tools, and test equipment. An employee considered qualified with respect to certain equipment and methods but still be unqualified for others if they have not been trained on that equipment.

A qualified person permitted to work within the Limited Approach Boundary of exposed live parts operating at 50 volts or more shall be additionally trained in the following:


1. The skills and techniques necessary to distinguish exposed energized parts from other parts of the electrical equipment.
2. The skills and techniques necessary to determine the nominal voltage of exposed live parts.
3. The safe approach distances and corresponding voltages to which the qualified person will be exposed too.
4. The decision-making process necessary to determine the degree and extent of the hazard and the PPE and job planning necessary to perform their tasks safely.

5.2.2 Unqualified Person

An unqualified person shall be trained in and be familiar with any of the electrical safety-related practices that might not be associated with basic electrical safety, but are essential for their safety.

5.3 Energized Electrical Parts and Systems

This section does not apply to power distribution or transmission lines. Refer to CFR Subpart "R" 1910.269 (servicing) and/or CFR Subpart "V" 1926.950 (construction) for overhead power transmission and distribution line requirements.

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Safety-related work practices shall be employed to prevent electric shock or other injuries resulting from either direct or indirect electrical contacts, when work is performed near or on equipment or circuits which are or may be energized. The specific safety-related work practices shall be consistent with the nature and extent of the associated electrical hazards.

Live parts to which an employee may be exposed shall be deenergized before the employee works on or near them, unless it can be demonstrated that deenergizing introduces additional or increased hazards or is infeasible due to equipment design or operational limitations. Live parts that operate at less than 50 volts to ground need not be deenergized if there will be no increased exposure to electrical burns or to explosion due to electric arcs.

If the exposed live parts are not deenergized (i.e., for reasons of increased or additional hazards or infeasibility), other safety-related work practices shall be used to protect employees who may be exposed to the electrical hazards involved. Such work practices shall protect employees against contact with energized circuit parts directly with any part of their body or indirectly through some other conductive object. The work practices that are used shall be suitable for the conditions under which the work is to be performed and for the voltage level of the exposed electric conductors or circuit parts. **These work practices will be covered in the Addendum.**

5.3.1 Working on or near exposed deenergized parts


This section applies to work on exposed deenergized parts near enough to expose employee/s to an electrical hazard.

While an employee is exposed to contact with fixed electrical equipment or circuits which have been deenergized, the circuits energizing the parts shall be locked out in accordance with Policy No. 14, Energy Control (Lockout).

The circuits and equipment to be worked on shall be disconnected from electrical energy sources (and locked out). Control circuit devices, such as push buttons, selector switches, and interlocks, shall not be used as the sole means for deenergizing circuits or equipment.

Procedures for the release of stored electric energy shall be covered in the Addendum to this policy section (as hot work).

When capacitors or associated equipment are handled, they shall be treated as energized.

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Stored non-electrical energy in devices that could reenergize electrical parts shall be blocked or relieved to the extent that the parts could not be accidentally energized by the device.

5.3.2 Working on or near exposed energized parts

Every effort shall be made to preclude work on energized electrical parts. When this is not possible, the requirements of this section shall apply. Potential contact with live energized parts includes work performed on exposed live parts (involving either direct contact or contact by means of tools or materials) or near enough to them for employees to be exposed to any hazard they present.

Only qualified persons shall work on electrical equipment that has not been deenergized.

If work is to be performed near overhead lines, the lines shall be deenergized and grounded, or other protective measures shall be provided before work is started.


If the lines are to be deenergized, arrangements shall be made with the person or organization that operates or controls the electric circuits involved to deenergize and ground them. If protective measures, such as guarding, isolating, or insulating are provided, these precautions shall prevent employees from contacting such lines directly with any part of their body or indirectly through conductive materials, tools, or equipment.

5.3.3 Overhead electrical lines

While conducting site activities near overhead lines, field personnel need to be aware of the location of the lines so as not to use conductive equipment (e.g., metal equipment to include: drill rigs; hand auger extensions; geoprobe units; excavators, etc.) in close proximity to power lines.

OSHA 29 CFR 1926.550 requires that any vehicle or mechanical equipment (i.e., drill rigs) capable of having parts of its structure elevated near energized overhead lines shall be operated so that a clearance distance of at least 10 feet is maintained.

When calculating clearance distances for a drill rig consider both the length of the derrick and the length of the rods. Position the rig such that if rods are ever fully extended from the top of the derrick, the rods will still be at least 10 feet away from the power lines. Note that rods can lean or sway when elevated so it may be necessary to maintain more than a 10-

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foot distance on the ground to ensure that there is a 10-foot horizontal distance between the rods and the power line.

Higher voltages require greater clearance distances. Contact the electrical utility company to verify line voltage. If the voltage is higher than 50kV, the clearance shall be increased 4 in. for every 10kV over that voltage.

Table 12-1	
Voltage	Required Clearance
0-50 kV	10 feet
50-200 kV	15 feet
200-350 kV	20 feet
350-500 kV	25 feet
500-750 kV	35 feet
750-1000 kV	45 feet

Under any of the following conditions, OSHA allows the required clearance to be reduced:

- If a vehicle is in transit with its structure lowered, the clearance shall be reduced to 4 ft. If the voltage is higher than 50kV, the clearance shall be increased 4 in. for every 10kV over that voltage
- If insulating barriers (boots) are installed to prevent contact with the lines, and if the barriers are rated for the voltage of the line being guarded and are not a part of or an attachment to the vehicle or its raised structure, OSHA allows the clearance to be reduced to a distance within the designed working dimensions of the insulating barrier. However, while this is permissible according to OSHA, some utility companies are recommending that safe distances, as described previously, be maintained in addition to the insulating barrier.
- If the equipment is an aerial lift insulated for the voltage involved, and if the work is performed by a qualified person, the clearance (between the uninsulated portion of the aerial lift and the power line) may be reduced to the distance given in Table 12-2.

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When an unqualified person is working in an elevated position near overhead lines, or working on the ground in the vicinity of overhead lines, the location shall be such that the person and the longest conductive object he or she may contact cannot come closer to any unguarded, energized overhead line than the clearance distances indicated in Table 12-1.

For voltages normally encountered with overhead power lines, objects which do not have an insulating rating for the voltage involved shall be considered to be conductive.

When a qualified person is working in the vicinity of overhead lines, whether in an elevated position or on the ground, the person shall not approach or take any conductive object without an approved insulating handle closer to exposed energized parts than the clearance distances indicated in Table 12-2, unless:

- The person is insulated from the energized part (gloves, with sleeves if necessary, rated for the voltage involved are considered to be insulation of the person from the energized part on which work is performed), or
- The energized part is insulated both from other conductive objects at a different potential and from the person, or
- The person is insulated from conductive objects at a potential different from that of the energized part

Table 12-2	
Approach Distances for Qualified Employees - Alternating Current	
Voltage range (phase to phase)	Minimum approach distance
300V and less	Avoid contact
Over 300V, not over 750V	1 ft. 0 in.
Over 750V, not over 2kV	1 ft. 6 in.
Over 2kV, not over 15kV	2 ft. 0 in.
Over 15kV, not over 37kV	3 ft. 0 in.
Over 37kV, not over 87.5kV	3 ft. 6 in.
Over 87.5kV, not over 121kV	4 ft. 0 in.
Over 121kV, not over 140kV	4 ft. 6 in.

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If the equipment is an aerial lift insulated for the voltage involved, and if the work is performed by a qualified person the clearance (between the uninsulated portion of the aerial lift and the power line) may be reduced to the distance indicated in Table 12-2. However, employees standing on the ground shall not contact the vehicle or mechanical equipment or any of its attachments, unless:


- The employee is using protective equipment rated for the voltage or the equipment is located so that no uninsulated part of its structure (that portion of the structure that provides a conductive path to employees on the ground) can come closer to the line than permitted in this section
- If any vehicle or mechanical equipment capable of having parts of its structure elevated near energized overhead lines is intentionally grounded, employees working on the ground near the point of grounding shall not stand at the grounding location whenever there is a possibility of overhead line contact. Additional precautions, such as the use of barricades or insulation, shall be taken to protect employees from hazardous ground potentials, depending on earth resistivity and fault currents, which can develop within the first few feet or more outward from the grounding point

5.3.4 Illumination

Employees shall not enter spaces containing exposed energized parts, unless illumination is provided that enables the employees to perform the work safely. Where lack of illumination or an obstruction precludes observation of the work to be performed, employees shall not perform tasks near exposed energized parts. Employees shall not reach blindly into areas which may contain energized parts.

5.3.5 Confined Space or enclosed space work

When an employee works in a confined or enclosed space (such as a manhole or vault) that contains exposed energized parts, protective shields, protective barriers, or insulating materials shall be used as necessary to avoid inadvertent contact with these parts. Doors, hinged panels, and the like shall be secured to prevent swinging into an employee and causing the employee to contact exposed energized parts (reference the Confined Spaces section (10) of this manual).

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5.3.6 Conductive materials and equipment

Conductive materials and equipment that are in contact with any part of an employee's body shall be handled in a manner that will prevent them from contacting exposed energized conductors or circuit parts.

For instance, an employee should measure the length of a sledge hammer and the expected radius of his swing prior to using the hammer near an energized circuit. If such a circuit is present, a sign must be posted to warn the employees. The job supervisor must inform the employees of the location of the lines, the hazards involved, and the protective measures to be taken.

5.3.7 Portable ladders

Portable ladders shall have nonconductive siderails if they are used where the employee or the ladder could contact exposed energized parts (Refer to Policy No. 24, Ladders).

5.3.8 Conductive apparel

Conductive articles of jewelry and clothing (such as watch bands, bracelets, rings, key chains, necklaces, metalized aprons, cloth with conductive thread, or metal headgear) shall not be worn if they might contact exposed energized parts. However, such articles may be worn if they are rendered nonconductive by covering, wrapping, or other insulating means.


5.3.9 Housekeeping duties

Where live parts present an electrical contact hazard, employees shall not perform housekeeping duties at such close distances to the parts that there is a possibility of contact, unless adequate safeguards (such as insulating equipment or barriers) are provided.

Electrically conductive cleaning materials (including conductive solids such as steel wool, metalized cloth, and silicon carbide, as well as conductive liquid solutions) shall not be used in proximity to energized parts unless procedures are followed which will prevent electrical contact.

5.3.10 Interlocks

Only a qualified person following the requirements of this section may defeat an electrical safety interlock, and then only temporarily while working on the equipment. The interlock system shall be returned to its operable condition when this work is completed.

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5.4 Grounding, GFCIs and Assured Grounding Procedures

Equipment, tools and cord sets shall be provided and utilized so as to protect employees from electrical shock and to prevent fire.

5.4.1 Equipment and tools

Note: Portable equipment which is "double insulated" and endorsed by a nationally recognized testing facility need not have a grounding conductor, but is subject to the inspection requirements of this section.

Tools and equipment subject to inspection and testing include:

- Portable Electrical Tools such as grinders, drills and stapling guns
- Stationary tools such as table saws, drill presses, and jig saws
- Portable electrical extension cords
- Portable and Temporary lighting systems and cords

Receptacles shall be of the grounding type and their contacts shall be grounded by connection to the equipment grounding conductor of the circuit supplying that receptacle in accordance with the NEC.

5.4.2 Visual inspections

Visual inspection of tools and equipment are required prior to each use and shall include:


- General condition
- Plugs and caps, and presence of ground prong
- Electrical cord sets
- External defects, and missing parts

Defective tools shall be tagged, taken out of service and placed in a secured location until they are repaired or destroyed.

5.4.3 Testing

The following tests shall be performed on all applicable equipment:

- Equipment grounding conductors shall be tested for continuity and shall be electrically continuous

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- Receptacle and attachment cap or plug shall be tested for correct attachment of the equipment-grounding conductor. The equipment-grounding conductor shall be connected to its terminal

Required tests should be performed as indicated below:

- Before first use
- Before being returned to service following any repairs
- Before being used, after any incident that can be reasonably suspected to have caused damage (for example, when a cord set is run over)
- At intervals not to exceed 3 months

Test equipment must be evaluated for proper operation immediately before and after tests are conducted.

5.4.4 Removal from service


Any equipment failing any test shall be taken out of service, shall be tagged with a "Danger, Do Not Use" tag, secured and repaired or destroyed.

5.4.5 Ground Fault Circuit Interrupters (GFCI's)

Ground Fault Circuit Interrupters (GFCI's) shall be used on receptacles ≥ 15 amps up to and including 30 amps for tool and equipment used in construction applications and potentially wet environments (either indoors or outdoors). Receptacles of temporary wiring systems and portable generators shall be protected with a GFCI.

The minimum requirements relative to the use of Ground Fault Circuit Interrupters are:

- Prior to use, and periodically thereafter, verify that the GFCI is in good working order. (e.g., Plug the GFCI in to an outlet, plug a power tool or light in to the GFCI, hit the "test" button and verify that it interrupts current flow). Periodically re-test the GFCI to ensure continued effectiveness.
- Remove from service any GFCI that has insufficient load capacity, is damaged or is ineffective for any reason. Affix a "Danger, Do Not Use" tag and store the GFCI in a secure location until it can be replaced or repaired. Destroy and discard any GFCI that cannot be repaired or re-used.

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- Train employees in the provisions of this section as related to safe use of GFCIs. This training should include:
 - Double insulated tools
 - Defective cords and plugs
 - Heavy moisture, and wet conditions
 - Operation, selection, and use of GFCI's

5.4.6 Assured Grounding Program


When this is not possible (feasible) to use GFCI's, the Assured Grounding procedures in this section shall apply and the Branch Office shall include as the Addendum to this policy section an Assured Grounding Program. It is best to avoid situations where an Assured Grounding Program is required because it is very labor intensive to comply. If unavoidable, the elements of this program shall include as a minimum:

- Written description of program
- Program coordinator
- Inspections
- Documented Testing
- Availability of Equipment
- Integrity of testing equipment (repairs/testing of test equipment)
- Handling of defective tools and equipment
- Who will perform tests, and repairs
- Recordkeeping
- How receptacles will be provided with GFCI's

Only qualified persons shall perform inspection and "color code" labeling of tools and equipment.

The color code scheme for labeling tools and equipment, as indicated in the following table, shall be used in the Addendum color scheme. This color code scheme is consistent with guidance from the Association of General Contractors. Tools and equipment shall be color coded on a quarterly basis when inspected and marked according to the Quarterly Code. If inspections are conducted monthly, the Monthly Code should be used. For example "Red & Blue" means the inspection was conducted in the first quarter during February.

Tape Color Coding System

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Month	Monthly Color Code	Quarterly Code
January	Red	Red
February	Red & Blue	
March	Red & White	
April	Blue	Blue
May	Blue & White	
June	Blue & Green	
July	White	White
August	White & Green	
September	White & Red	
October	Green	Green
November	Green & Red	
December	Green & Blue	

5.5 Temporary Wiring

This section applies to temporary electrical power and lighting wiring methods that may be of a class less than would be required for a permanent installation.

Temporary wiring shall be removed immediately upon completion of work and when the purpose for which the wiring was installed no longer applies.

5.5.1 General requirements for temporary wiring


Feeders shall originate in a distribution center. The conductors shall be run as multi-conductor cord or cable assemblies or within raceways.

Branch circuits shall originate in a power outlet or panel board. Conductors shall be run as multi-conductor cord or cable assemblies or open conductors, or shall be run in raceways. Conductors shall be protected by over current devices at their ampacity.

Receptacles shall be of the grounding type. Unless installed in a complete metallic raceway, each branch circuit shall contain a separate equipment-grounding conductor, and receptacles shall be connected to the grounding system. Receptacles shall not be connected to the same ungrounded conductor of multi-wire circuits that supply temporary lighting.

Disconnecting switches or plug connectors shall be installed to permit the disconnection of ungrounded conductors of each temporary circuit.

Lamps for general illumination shall be protected from accidental contact or breakage. Metal-case sockets shall be grounded.

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The electric cords shall not be used to suspend temporary lights unless cords and lights are designed for this means of suspension. Temporary lighting shall be properly supported.

Portable electric lighting used in wet and/or other conductive locations, as for example, drums, tanks, and vessels, shall be operated at 12 volts or less. However, 120-volt lights may be used if protected by a ground-fault circuit interrupter.

A mounted box (with a cover) shall be used wherever a change is made to a raceway system or a cable system that is metal clad or metal sheathed. Non-metallic wiring system joints below seven foot (7') shall have mounted boxes and be covered. Exposed temporary joints shall have the wire nuts or other mechanical devices taped with black (electrical) tape to prevent them from falling off. Temporary joints including the ground wire shall have a mechanical connection.

Flexible cords and cables shall be protected from damage. Sharp corners and projections shall be avoided. Flexible cords and cables may pass through doorways or other pinch points, if protection is provided to avoid damage. Cords and temporary wiring passing through walls shall be properly protected (e.g. sleeved).


Extension cord sets used with portable electric tools and appliances shall be of three-wire type and shall be designed for hard or extra-hard usage. Flexible cords used with temporary and portable lights shall be designed for hard or extra-hard usage. See the NEC, ANSI/NFPA 70, in Article 400, Table 400-4 that lists various types of flexible cords, some of which are noted as being designed for hard or extra-hard usage. Note: SEU, SER or other similar cables cannot be laid on the floor despite their rating.

For temporary wiring over 600 volts, nominal, fencing, barriers, or other effective means shall be provided to prevent access of other than authorized and qualified personnel.

5.6 Batteries

5.6.1 General

Batteries of the unsealed type shall be located in enclosures with outside vents or in well ventilated rooms and shall be arranged so as to prevent the escape of fumes, gases, or electrolyte spray into other areas.

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Ventilation shall be provided to ensure diffusion of the gases from the battery and to prevent the accumulation of an explosive mixture.

Appropriate face shields, aprons, goggles and rubber gloves shall be provided for workers handling acids or batteries. Contact lenses are prohibited while working with batteries, unless using a type of goggle that will not allow the transference of gases.

Facilities for quick drenching of the eyes and body shall be provided within 25 feet of battery handling areas. Facilities shall be provided for flushing and neutralizing spilled electrolyte and for fire protection in the areas of battery use.

Battery charging installations shall be located in areas designated for that purpose. When batteries are being charged, the vent caps shall be kept in place to avoid electrolyte spray. Vent caps shall be maintained in a functioning condition.

Battery manufacturer guideline specifics covering 5.5.2 through 5.5.4 of this policy section shall be met.

Smoking, eating or drinking in areas where batteries are being stored, charged or worked with is prohibited.

5.6.2 Handling and transportation

Packaging, markings and transportation of batteries shall be in accordance with Federal, State and local laws, regulations and standards.

After the packaging is removed, batteries shall be inspected for defect, including, but not limited to:

- Bulging
- Cracking
- Leaking


Batteries shall not be forced into equipment/locations.

Where feasible, old and new batteries shall not be intermixed.

5.6.3 Storage

Batteries shall be kept in their original packaging until they are ready to be used.

New and used batteries shall be kept separate for distinguishment.

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Batteries should be stored separate from combustibles and flammables and protected from being crushed, punctured or exposed to incompatible environmental conditions.

Used batteries, not intended for re-use, shall be properly disposed.

5.6.4 Disposal

Batteries being disposed of shall be done so in accordance with Federal, State and local laws, regulations and standards. When possible, batteries should be recycled.

5.7 Clearances in the Work Place

Employees shall not be permitted to work in such proximity to any part of an electric power circuit that the employee could contact the electric power circuit in the course of work, unless the employee is protected against electric shock by deenergizing the circuit and grounding it (if appropriate) or by guarding it effectively by insulation or other means.

Supervisors and/or Competent Person(s) shall ascertain by inquiry, direct observation, or by instruments, whether any part of an energized electric power circuit, exposed or concealed, is so located that the performance of the work may bring any person, tool, or machine into physical or electrical contact with the electric power circuit. The supervisor/Competent Person shall post and maintain proper warning signs where such a circuit exists. The supervisor/Competent Person shall advise employees of the location of such lines, the hazards involved, and the protective measures to be taken.


Barriers or other means of guarding shall be provided to ensure that workspace for electrical equipment will not be used as a passageway during periods when energized parts of electrical equipment are exposed.

5.8 Fuses

Installing or removing fuses shall be considered as work with live electrical energy and shall be covered in the Addendum to this policy section for operations conducting such activities.

Persons who perform work on high voltage fuses (over 600 volts) shall wear appropriate head, face, body flash suits, protective footwear and insulated gloves.

Insulating electrical gloves, sleeves, aprons, and other protective electrical clothing shall be tested for leaks and integrity prior to initial use and periodically. These tests shall meet the requirements of OSHA Standard 29 CFR 1910.137.

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Protector gloves shall be worn over insulating gloves, except as defined in the above referenced standard.

Only manufacturer-qualified personnel shall inspect and make repairs to electrical insulating protective clothing.

5.9 Work Space Clearances - 600 Volts, nominal, or less

5.9.1 Working space about electric equipment

Sufficient access and working space shall be provided and maintained about electric equipment to permit ready and safe operation and maintenance of such equipment.


5.9.2 Working clearances

Except as required or permitted elsewhere in this section, the dimension of the working space in the direction of access to live parts operating at 600 volts or less and likely to require examination, adjustment, servicing, or maintenance while live shall not be less than indicated in the table below.

In addition to the dimensions shown in the following table, workspace shall not be less than 30 inches wide in front of the electric equipment. Distances shall be measured from the live parts if they are exposed, or from the enclosure front or opening if the live parts are enclosed. Walls constructed of concrete, brick, or tiles are considered to be grounded.

Working space is not required in back of assemblies such as dead-front switchboards or motor control centers where there are no renewable or adjustable parts such as fuses or switches on the back and where connections are accessible from locations other than the back.

Minimum Depth of Clear Working Space in Front of Electric Equipment (feet)			
Nominal voltage to ground conditions*	(a)*	(b)*	(c)*
0-150	3	3	3
151-600	3	3 1/2	4

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*Conditions (a), (b), and (c) are as follows: (a) Exposed live parts on one side and no live or grounded parts on the other side of the working space, or exposed live parts on both sides effectively guarded by insulating material. Insulated wire or insulated bus bars operating at not over 300 volts are not considered live parts. (b) Exposed live parts on one side and grounded parts on the other side. (c) Exposed live parts on both sides of the workspace [not guarded as provided in Condition (a)] with the operator between.

Note: For International System of Units (SI): one foot=0.3048m.

Working space required by this in this section shall not be used for storage. When normally enclosed live parts are exposed for inspection or servicing, the working space, if in a passageway or general open space, shall be guarded.

At least one entrance shall be provided to give access to the working space about electric equipment.


Where there are live parts normally exposed on the front of switchboards or motor control centers, the working space in front of such equipment shall not be less than 3 feet.

The minimum headroom of working spaces about service equipment, switchboards, panel boards, or motor control centers shall be 6 feet 3 inches.

5.9.3 Guarding of live parts

Except as required or permitted live parts of electrical equipment operating at 50 volts or more shall be guarded against accidental contact by cabinets or other forms of enclosures, or by any of the following means:

- By location in a room, vault, or similar enclosure that is accessible only to qualified persons
- By partitions or screens so arranged that only qualified persons will have access to the space within reach of the live parts. Any openings in such partitions or screens shall be so sized and located that persons are not likely to come into accidental contact with the live parts or to bring conducting objects into contact with them
- By location on a balcony, gallery, or platform so elevated and arranged as to exclude unqualified persons

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In locations where electric equipment could be exposed to physical damage, enclosures or guards shall be so arranged and of such strength to prevent damage.

Entrances to rooms and other guarded locations containing exposed live parts shall be marked with conspicuous warning signs forbidding unqualified persons to enter.

5.10 Work Space Clearances - over 600 volts, nominal

Conductors and equipment used on circuits exceeding 600 volts, nominal, shall comply with all applicable provisions of this section and with the following provisions that supplement or modify those requirements. The provisions of paragraphs (5.9.2), (5.9.3), and (5.9.4) of this section do not apply to equipment on the supply side of the service conductors.

5.10.1 Enclosure for electrical installations

Electrical installations in a vault, room, closet or in an area surrounded by a wall, screen, or fence, access to which is controlled by lock and key or other equivalent means, are considered to be accessible to qualified persons only.


A wall, screen, or fence less than 8 feet in height is not considered adequate to prevent access unless it has other features that provide a degree of isolation equivalent to an 8-foot fence. The entrances to buildings, rooms or enclosures containing exposed live parts or exposed conductors operating at over 600 volts, nominal, shall be kept locked or shall be under the observation of a qualified person at all times.

5.10.2 Installations accessible to qualified persons only

Electrical installations having exposed live parts shall be accessible to qualified persons only and shall comply with requirements of this standard and applicable regulatory standards.

5.10.3 Installations accessible to unqualified person(s)

Electrical installations that are open to unqualified persons shall be made with metal-enclosed equipment or shall be enclosed in a vault or in an area, access to which is controlled by a lock. Metal-enclosed switchgear, unit substations, transformers, pull boxes, connection boxes, and other similar associated equipment shall be marked with appropriate caution signs. If equipment is exposed to physical damage from vehicular traffic, guards shall be provided to prevent such damage. Ventilating or similar openings in metal-enclosed equipment shall be designed so that foreign

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objects inserted through these openings will be deflected from energized parts.


5.10.4 Workspace about equipment

Sufficient space shall be provided and maintained about electric equipment to permit ready and safe operation and maintenance of such equipment. Where energized parts are exposed, the minimum clear workspace shall not be less than 6 feet 6 inches high (measured vertically from the floor or platform), or less than 3 feet wide (measured parallel to the equipment). The depth shall be as required in the table below. The workspace shall be adequate to permit at least a 90-degree opening of doors or hinged panels.

The minimum clear working space in front of electric equipment such as switchboards, control panels, switches, circuit breakers, motor controllers, relays, and similar equipment shall not be less than specified in the following table, unless otherwise specified. Distances shall be measured from the live parts if they are exposed, or from the enclosure front or opening if the live parts are enclosed.

However, working space is not required in back of equipment such as dead front switchboards or control assemblies where there are no renewable or adjustable parts (such as fuses or switches) on the back and where connections are accessible from locations other than the back. Where rear access is required to work on de-energized parts on the back of enclosed equipment, a minimum working space of thirty (30) inches horizontally shall be provided.

Minimum Depth of Clear Working Space in Front of Electric Equipment (feet)			
Nominal voltage to ground conditions*	(a)*	(b)*	(c)*
601 to 2,500	3	4	5
2,501 to 9,000	4	5	6
9,001 to 25,000	5	6	9
25,001 to 75 kV	6	8	10
Above 75kV	8	10	12

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*Conditions (a), (b), and (c) are as follows: (a) Exposed live parts on one side and no live or grounded parts on the other side of the working space, or exposed live parts on both sides effectively guarded by insulating materials. Insulated wire or insulated bus bars operating at not over 300 volts are not considered live parts. (b) Exposed live parts on one side and grounded parts on the other side. Walls constructed of concrete, brick, or tiles are considered to be grounded surfaces. (c) Exposed live parts on both sides of the workspace [not guarded as provided in Condition (a)] with the operator between.

Note: For International System of Units (SI): one foot=0.3048m.

5.10.5 Lighting outlets and points of control

The lighting outlets shall be so arranged that persons changing lamps or making repairs on the lighting system will not be endangered by live parts or other equipment. The points of control shall be so located that persons are not likely to come in contact with any live part or moving part of the equipment while turning on the lights.


5.10.6 Elevation of unguarded live parts

Unguarded live parts above working spaces shall be maintained at elevations not less than specified in the following table.

Elevation of Unguarded Energized Parts Above Working Space	
Nominal voltage between phases	Minimum elevation
601-7,500	8 feet 6 inches
7,501-35,000	9 feet.
Over 35kV	9 feet+0.37 inches per kV above 35kV
Note: For SI units: one inch=25.4 mm; one foot=0.3048 m.	

5.10.7 Entrance and access to workspace

At least one entrance not less than 24 inches wide and 6 feet 6 inches high shall be provided to give access to the working space about electric equipment. On switchboard and control panels exceeding 48 inches in width, there shall be one entrance at each end of such board where practicable. Where bare energized parts at any voltage or insulated

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energized parts above 600 volts are located adjacent to such entrance, they shall be guarded.

6.0 Appendices

00-01 – Title of Appendix Section

7.0 References

- Occupational Safety and Health Administration (OSHA), 29 CFR 1910, Subpart R & S.
- Occupational Safety and Health Administration (OSHA) 29CFR 1926, Subparts K & V.
- National Electrical Code (NEC).

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1.0 Policy

Cranes and rigging shall be used safely and in accordance with their designed purpose.

This policy covers minimum performance standards applicable to all ATC Associates employees and locations. Local practices requiring more detailed or stringent rules, or local, state or other federal requirements regarding this subject can and should be added as an addendum to this procedure as applicable.

2.0 Purpose

To define the procedures and standards for the use, care, control, and operation of cranes and associated rigging equipment.

3.0 Scope

All ATC Associates work sites, i.e., AC offices, client job sites, etc., requiring the use of cranes and rigging.

4.0 Definitions

Crane (within this Policy section) means any mobile lifting equipment with 2000 pounds or more of lifting capacity, excluding forklifts, boom trucks, tower cranes and digger derricks.

5.0 Requirements

5.1 Mobile Cranes

5.1.1 General Operation of Mobile Cranes

Prior to operating, or hiring a subcontractor to operate a crane, consult with ATC's Director of Risk Management to determine if special "riggers" liability or "hook" liability insurance is needed. Also determine if ATC's standard subcontractor terms and conditions should be modified to require the subcontractor to purchase the insurance and name ATC as an additional insured. This is not a standard insurance coverage for ATC but should be for a crane operator. Failure to obtain the insurance could cause ATC to experience an uninsured loss.

Only persons designated by ATC Associates as competent operators shall be permitted to operate cranes. Each work site shall maintain a list of such competent operators where ATC Associates uses or employs the use of cranes.

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Crane operators shall be competent for the type of crane being utilized. Skills must be verified with visual observation of operating skills on a predetermined course that adequately tests the operating skills. Verification of skills shall be documented.

When a third party provides a crane operator, the third party must provide written evidence that their employee is a qualified operator in accordance with this procedure or approved equivalent.

Cranes shall not be operated beyond 75% (percent of their configured lifting capacity) at the specified boom length in calm conditions. Any lift 60 % or more of a crane capacity requires a lift plan. Any planned load over 50,000 pounds requires a lift plan. Lift plans must be stamped by a registered Professional Engineer. The load rating chart, with clearly legible letters and figures, shall be provided with each crane and securely affixed to the crane cab in a location easily visible to the operator while seated at control station.

Outriggers shall be fully extended when loads are being lifted, and the crane shall be in the level position.

Prior to any lift, the ground shall be inspected to verify that the surface will bear the weight of the crane and its intended load.


Prior to traveling on any road, the weight capacity of that route shall be verified to ensure that the surface will bear the weight of the crane and its intended load.

The swing radius of cranes shall be marked with a barrier to warn others (on the ground or in other equipment) of its swing radius.

Only established hand signals shall be used to direct the crane operator during lifting operations. Only designated persons are permitted to give hand signals to crane operators, except during an emergency. In this instance, any person may give a stop signal.

The crane operator is responsible for making the decision to initiate the lift.

Crane operators are required to wear the minimum required personal protective equipment. A fire extinguisher is required to be maintained in the cab of the crane.

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Employees shall not be permitted within the crane radius or conducting any service activity on a crane while it is being moved, lifting a load, or being operated in any manner.

The boom of cranes shall be in the lowered and retracted position when moving from location to location.

Cranes should not be used to transport or walk loads from one location to another.

During severe storm or weather conditions the crane boom shall be lowered or placed in a position that precludes damage to the crane itself or immediate surroundings.

5.1.2 Inspection of Mobile Cranes

Certification and inspection requirements are often subject to local requirements that must be identified before any lifts are made.

The operator or other designated competent person shall inspect cranes prior to their use each day for defects, and unsatisfactory conditions. These inspections shall be documented.

If defects or other unsafe conditions are found during an inspection, the crane shall be taken out of service until repairs have made. A record of repairs and associated maintenance of cranes shall be documented.

Providers of rental or leased cranes shall provide proof to ATC Associates that the Preventive Maintenance program and annual inspection of their equipment is current. A copy of this annual inspection report should be kept in the operator cab of cranes.

Inspections shall be documented on cranes using the Crane Inspection Record form (Refer to Appendix 11-01), or via an equivalent inspection form.

5.2 Rigging (slings, hooks and chains)

5.2.1 General

Rigging hooks and hooks on cranes, except shagging hooks shall have a safety latch or be "moused". Latches shall be in place on all hooks, eliminating the hook throat opening.

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Each sling shall be accompanied with a “Sling Rating Tag”. This tag will identify the maximum amount of load the sling is able to sustain.

Slings, hooks, and other rigging equipment shall be used in accordance with their designed purpose and manufacturer specifications. The recommended safe working load shall not be exceeded.

Tag lines shall be used to guide and control loads that are being lifted and moved. Employees shall not be allowed to guide loads directly with their hands.

Employees shall be required to keep clear of loads being moved and lifted. No personnel are allowed under a load being lifted or moved.

Employees shall not be permitted to ride or be on suspended loads being lifted or moved by cranes.

Rigging equipment such as nylon slings, and wire rope slings shall not be used in conjunction with personnel fall protection equipment or fall protection systems. This includes using rigging equipment as anchor points, beam wraps, or an extension of a fall arrest system.

Rigging equipment for materials handling shall be inspected prior to use to ensure it is safe to use. When not in use, rigging equipment shall be removed from the immediate work area.


5.2.2 Inspection

An inspection program for slings, hooks, and chains shall be implemented wherever slings, hooks, and chains are used in rigging and to lift loads. Manufacturer guidelines shall be followed for inspections.

Defective rigging equipment shall be tagged “Do Not Use” and taken out of service and removed from the work area if practical. If repairs cannot be made or repairs are prohibited, the equipment shall be destroyed or returned to the owner.

A competent person shall periodically inspect the condition of lifting hooks. Hooks that are deformed, or stretched 10% of the throat or 15% twist shall be removed from service, and destroyed.

5.3 Personnel Basket Use

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Requires prior approval by the Branch Safety Officer or Regional Safety Coordinator and shall be considered in accordance with OSHA as the least preferred method of personnel transport.

5.4 Overhead Clearance

The operation of mobile equipment near energized electrical power lines shall conform to Policy No. 12, Electrical - General. A person shall be designated to observe clearance of the equipment and give timely warning for operations where it is difficult for the operator to maintain the desired clearance by visual means.

Cage-type boom guards, insulating links, or proximity warning devices may be used on cranes, but the use of such devices shall not alter the requirements of any other regulation of this part even if such device is required by law or regulation.

Any overhead wire shall be considered to be an energized line unless and until the person owning such line or the electrical utility authorities indicate that it is not an energized line and it has been visibly grounded.

Prior to work near transmitter towers where an electrical charge can be induced in the equipment or materials being handled, the transmitter shall be de-energized or tests shall be made to determine if electrical charge is induced on the crane. The following precautions shall be taken when necessary to dissipate induced voltages.


The equipment shall be provided with an electrical ground directly to the upper rotating structure supporting the boom; and ground jumper cables shall be attached to materials being handled by boom equipment when electrical charge is induced while working near energized transmitters. Employees shall be provided with nonconductive poles having large alligator clips or other similar protection to attach the ground cable to the load.

6.0 Appendices

11-01 – Crane Inspection Record

7.0 References

- Occupational Safety and Health Administration (OSHA), 29 CFR Part 1926.550, Cranes.
- Occupational Safety and Health Administration (OSHA), 29 CFR Part 1926.251, Materials Handling.

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Crane Inspection Record

Type Equipment: _____ **Unit No.:** _____

Location: _____ **Project No.:** _____

Inspected by: _____ **Date:** _____


Indicate by initialing "Yes" if item checked is adequate is operational, and safe. Initial "No" to indicate repair or other action is required. Use NA to indicate "Not applicable".

Item to be checked		YES	NO	NA
a.	Load line, lubricated, wound properly on drum, condition			
b.	Whip line, lubricated, wound properly on drum, condition			
c.	Hook and safety latches on load block			
d.	Hook and safety latches on headache ball			
e.	Cable at wear points			
f.	Pins in becket			
g.	Wedges installed			
h.	Clamps on dead ends			
i.	Hydraulic lines, no leakage			
j.	Outriggers, outrigger pads and pins			
k.	Lights, turn signals			
l.	Horn			
m.	Engine oil			
n.	Engine water level			
o.	Boom pins			
p.	Cotter pins			
q.	Steering			
r.	Tires			
s.	Controls, check operation in all motions			
t.	Brakes			
u.	Instruments			
v.	Load chart in place, legible			
w.	Windshield, clean, wipers functional			
x.	Fire extinguisher in cab			

Note defects found must be repaired prior to equipment use. On completion of inspection, retain this form with the equipment till the end of the workday. Then turn in to immediate supervision for filing.

 Signature of Person Completing Repairs

 Date Repaired

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1.0 Policy

Systems shall be utilized to ensure the safety of employees who are required to enter confined spaces. Only those ATC employees who have received specifically required training and certification on confined space entry shall be allowed to enter and/or attend a Confined Space.

This policy covers minimum performance standards applicable to all ATC Associates employees and locations. Local practices requiring more detailed or stringent rules, or local, state or other federal requirements regarding this subject can and should be added as an addendum to this procedure as applicable.

2.0 Purpose

To set forth procedures for the safe entry to Confined Spaces.

3.0 Scope

Applies to all ATC Associates work sites, i.e., ATC offices, client job sites, etc., involving Confined Space entry.

4.0 Definitions


Attendant - means an individual stationed outside Permit-Required Confined Spaces that monitors the authorized Entrants and who performs all Attendants' assigned duties.

Authorized Entrant - means an individual who is authorized to enter a Confined Space.

Blanking or blinding - means an absolute closure of a pipe, line, or duct by the fastening of a solid plate (such as a spectacle blind or a skillet blind) that completely covers the bore and that is capable of withstanding the maximum pressure of the pipe, line, or duct with no leakage beyond the plate.

Confined Space - means a space that is large enough and so configured that an individual can enter and perform assigned work; has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry.); and is not designed for continuous occupancy. A Permit-Required Confined Space has one or more of the following characteristics:

- Contains or has a potential to contain a hazardous atmosphere
- Contains a material that has the potential for engulfing an Entrant

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- Has an internal configuration such that an Entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross- section
- Contains any other recognized serious safety or health hazard

Confined Space Permit - means a written or printed document that allows persons to enter into a Permit-Required Confined Space.

Double Block & Bleed - means the closure of a line, duct, or pipe by closing and locking or tagging two in-line valves and by opening and locking or tagging a drain or vent valve in the line between the two closed valves.

Emergency - means any occurrence (including any failure of hazard control or monitoring equipment) or event internal or external to the Permit-Required Confined Space that could endanger Entrants.

Engulfment - means the surrounding and effective capture of a person by a liquid or finely divided (flowable) solid substance that can be aspirated to cause death by filling or plugging the respiratory system or that can exert enough force on the body to cause death by strangulation, constriction, or crushing.


Entry - means the action by which a person passes through an opening into a Permit-Required Confined Space. Entry includes ensuing work activities in that space and is considered to have occurred as soon as any part of the Entrant's body breaks the plane of an opening into the space.

Entry Supervisor - means the person responsible for determining if acceptable entry conditions are present at a Permit-Required Confined Space where entry is planned, for authorizing entry and overseeing entry operations, and for terminating entry as required by this section. An Entry Supervisor may also be acting as an Attendant.

Hazardous Atmosphere - means an atmosphere that may expose persons to the risk of death, incapacitation, impairment of ability to self-rescue (that is, escape unaided from a Permit Space), injury, or acute illness.

Line Breaking - means the intentional opening of a pipe, line, or duct that is or has been carrying flammable, corrosive, or toxic material, an inert gas, or any fluid at a volume, pressure, or temperature capable of causing injury.

Permit-Required Confined Space Program (Permit Space Program) - means the employer's overall program for controlling, and, where appropriate, for protecting employees from, Permit Space hazards and for regulating employee entry into Permit-Required Confined Spaces.

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Permit System - means a written procedure for preparing and issuing Permits for entry and for returning the Permit Space to service following termination of entry.

Prohibited Condition - means any condition in a Permit Space that is not allowed by the Permit during the period when entry is authorized.

Oxygen Deficient Atmosphere - means an atmosphere containing less than 19.5 percent oxygen by volume.

Oxygen Enriched Atmosphere - means an atmosphere containing more than 23.5 percent oxygen by volume.

Rescue Service - means the personnel designated to rescue employees from Permit Spaces.

Retrieval System - means the equipment (including a retrieval line, chest or full-body harness, wristlets, if appropriate, and a lifting device or anchor) used for non-entry rescue of persons from Permit Spaces.

Testing - means the process by which the hazards that may confront Entrants of a Permit Space are identified and evaluated. Testing includes specifying the tests that are to be performed in the permit space.


5.0 Requirements

5.1 General

Employees shall be informed of identified Permit-Required Confined Spaces for the work site as they are identified.

Only properly trained and authorized personnel may be permitted to enter a Permit-Required Confined Space or perform specific assigned duties related to entry into Permit-Required Confined Spaces. Confined Space training is required:

- Prior to initial assignment;
- Prior to a change in assigned duties;
- Whenever there is a change in assigned duties;
- Whenever there is a change in Permit-Space operations that presents a hazard about which an employee has not previously been training; or
- Whenever ATC Management has reason to believe that there are deviations from the Permit-Space Entry procedures or that there are inadequacies in an employee's knowledge or use of these procedures.

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The training must establish employee proficiency in the duties required for their assignment and shall introduce new or revised procedures, as necessary.

All training must be properly documented, including: employee's name, signatures or initials of the trainers, and the dates of training. The documentation (certification of training) shall be available for inspection.

The Confined Space Pre-Job Assessment Form (Appendix 10-01) must be completed (in addition to the Site Health and Safety Plan requirements) for each potential confined space identified where entry is planned.

Danger signs or other equivalent means shall be used to warn of existing confined spaces that are accessible by employees and others. The wording shall be " DANGER-PERMIT-REQUIRED CONFINED SPACE, DO NOT ENTER" or other equivalent language.

Required safety equipment shall be at the confined space work area, in working order, and instruments calibrated.

5.2 Initial Evaluation of Confined Spaces


Confined spaces shall be considered as Permit-Required Confined Spaces until a competent person conducts an initial evaluation of the work site to identify Permit-Required Confined Spaces. This evaluation shall be recorded on the Confined Space Pre-Job Assessment Form (Appendix 10-1). Confined spaces shall be classified as follows:

- Non Hazardous
- Hazardous due to work task
- Hazardous due to internal condition

If the work site contains Permit-Required Confined Spaces, danger signs stating "DANGER - CONFINED SPACE - ENTER BY PERMIT ONLY" or equivalent shall be posted to inform employees of the existence and location of the spaces. Bilingual signs shall be posted as necessary.

5.3 Reclassification or Canceling of Permit Required Spaces

Permit-Required Confined Spaces shall be reclassified as non-Permit Spaces under the following circumstances:

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- The space has no actual or potential atmospheric hazards and if hazards within the space are eliminated without entry into the space
- If testing and inspection during entry demonstrates that the hazards within the space have been eliminated and remain eliminated
- If the Permit-Required Confined Space is to be reclassified as a non Permit Space, the basis for determining that hazards have been eliminated shall be documented on Appendix 10-2.
- If a hazard returns, personnel shall evacuate the space and the space shall be reevaluated
- If new hazards are identified that are not part of the original Permit, personnel shall immediately evacuate the space and the confined space shall be re-evaluated
- Cancelled Permits shall be kept on file for a period of at least 12 months and reviewed to determine problems encountered.

5.4 Confined Space Entry Form

The responsible Supervisor shall ensure that a Confined Space Entry Form (reference Appendix 10-03) is completed prior to the entry of any Permit-Required Confined Space. Completion of this form involves the following activities:

- Assessing hazards
- Atmospheric testing
- Identification of qualified:
 - Entrant
 - Attendant
 - Entry Supervisor
 - Person performing atmospheric testing
- Establishment of Rescue method and Rescue Service
- De-energizing systems
- Cleaning of Confined Spaces
- Types of equipment required
- Hazards that may be generated through work activities
- Communication methods
- Concluding entry operations and cancellation of Permits

Each participant in confined space entry operations has a distinct role, and must be trained and qualified to perform that role. This includes those listed above. The names and assignments of each must be provided on both the Confined Space Pre-Job Assessment Form and the actual Confined Space Entry Permit.

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Confined Space Permits are valid for the work period or work shift and become void and shall be reissued when:

- There is an unplanned interruption in the work process
- The surrounding conditions change that introduce a new hazard
- Personnel leave the space to perform other work
- The work space is left unattended
- The work period (normal time a person or crew is scheduled to work during that day) ends
- When new crew assumes the work assignments of the existing work crew

Permits are not void during any single work period when crewmembers are added to the existing crew or when crewmembers are replaced on a planned rotational basis and the provisions of the Permit are met including training and instructions.

Permits become void when the scope of work exceeds the definition of work defined on the Permit, and when work is required to be completed that is not covered by the Permit.


Confined Space Permits shall be posted at the confined space work area until the work is completed. At the conclusion of work, the Permit shall be returned to the issuer (i.e. Entry Supervisor, client, etc.).

Completed confined space Permits shall be kept for a minimum of 12 months and until a review of the confined space Permit program is completed.

5.5 Atmospheric Testing

Atmospheric conditions of a confined space shall be tested with calibrated equipment prior to entry of personnel and as identified by the Initial Evaluation of Confined Spaces (5.2 of this section). Atmospheric testing shall be completed as indicated below and recorded on the Entry Permit:

- Oxygen content shall be tested. The acceptable range is 19.5 to 23.5 percent
- Test for combustible gas and vapors. Acceptable range is 0 to 10 percent of the Lower Flammable Limit (or Lower Explosive Limit). Record readings on the Entry Permit
- Check for toxic gases and airborne combustibles (e.g. dusts) as identified by the initial determination of confined spaces (5.2 of this

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section). Safe operating levels can be determined from the Permissible Exposure Level (PEL) as listed in OSHA 29 CFR 1910.1000, applicable Material Safety Data Sheets (MSDSs) or as provided by the client

- Verify that conditions in the space are acceptable for entry throughout the duration of an authorized entry. Entrants and/or Attendants may participate in testing and also request additional monitoring

See testing equipment requirements in Policy No. 23, Industrial Hygiene. Personnel conducting atmospheric testing must be properly trained for this function.


5.6 Pre-Entry (Occurring Prior to Entry)

Where entry operations will involve employees of more than one employer, proper planning is critical to ensure the safety of all participants. Close coordination must be established between all employers. All parties must discuss the roles of each in safe entry operations. Representatives of each must participate in pre-planning and Entry Permit preparation, as well as monitoring and supervision of entry activities.

Only those persons receiving specifically required training and certification on confined space entry shall be allowed to enter and/or attend a Confined Space. This training shall be documented at orientation and at the required pre-job meeting (see Confined Space Pre-Job Assessment Form – Appendix 10-01) defining the specific requirements of the confined space being entered. Annual refresher training shall be conducted for all applicable ATC personnel to include emergency rescue drills.

Persons who enter Confined Space, Attendant(s), and Entry Supervisor shall receive the following minimum instructions concerning the confined space:

- How to recognize symptoms of the specific potential hazards of the confined space
- The consequences of exposure to potential hazards
- When to evacuate the confined space
- Adhering to instruction of the Attendant
- Evacuating when alarms sound
- How communications will be maintained
- What to do if an exposure occurs or there is a release of a substance
- Shutting off tools during an emergency

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Sources of energy or contaminants shall be controlled, such as:

- Electrical energy
- Pressurized systems such as pipelines and vessels are isolated through double blocking, blinding, bleeding, and depressurization
- Extreme heat and extreme cold conditions

Pre-entry atmospheric testing shall be completed (5.5 of this section).

The method of ventilating the confined space shall be established (5.7 of this section).

The approved tools shall be identified and staged at or near the entry point of the confined space. Tools, electrical tools and lighting systems shall be approved for use in confined spaces as identified by the Initial Evaluation of confined spaces (5.2 of this section).

Depending upon the Pre-Job Assessment (see Appendix 10-01), lighting and electrical equipment may be either low voltage (50V or less), or conventional 120V portable lamps and tools if powered by approved ground-fault circuit interrupter devices and the work is not an electrically hazardous location. Pneumatic equipment may be used instead of electrical equipment.

Required rescue procedures and rescue equipment that shall be staged at the confined space (refer to Section 5.9).


The safe methods to enter, exit, and escape for personnel (including rescue personnel during retrieval) working in a Permit-Required Confined Space shall be developed during the job planning phase, specified on, and included, as needed, on the Entry Permit.

Where required due to activities in close proximity to the confined space, provide protection for both the Entrants and others in the vicinity by using appropriate barricades and warning devices. Where vehicle may be present, additional protection will be needed to protect those in the confined space.

Personnel have been issued required personal protective equipment (PPE).

Persons who enter confined spaces shall be logged using the Confined Space Pre-Job Assessment Form (Appendix 10-01).

5.7 Ventilation of Confined Spaces

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Powered ventilation shall occur before entry into Permit-Required Confined Space and continue until after the employees have left the space. Layout of ventilation equipment will be made in such a manner that the air is being sent throughout the entire confined space. Forced air ventilation shall come from a clean source and may not increase hazards.

Air hoses with diffusers may not be used to provide forced ventilation.

Air sampling shall be conducted prior to personnel entry to assure the safety of the space and periodic air sampling shall be continued thereafter in the space when forced ventilation is used.

Forced ventilation may be used to:

- To remove contaminants created by work activities such as welding
- As a method of maintaining controlling the ambient temperature of a confined space when the rise in temperature is caused by atmospheric conditions.

Ventilation shall occur only by forcing air into a confined space. If it is necessary to exhaust hazardous gases, such as those produced when welding, the air being forced into the confined space shall be increased by at least the amount that is being exhausted out of the space.

5.8 Performance of Work


5.8.1 General

At least one Attendant must be provided outside the Permit Space into which entry is authorized, and this Attendant must be present for the duration of entry operations. If an emergency or other unplanned event takes place during the course of work the Confined Space Work Permit is void.

The Attendant and Entry Supervisor have the authority to discontinue work activities at any time.

Compressed gas cylinders other than a self-contained breathing apparatus should not be taken into a Confined Space.

The hoses of gas cutting and welding tools shall be inspected for leaks prior to taking them into any Confined Space.

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Scaffolds constructed inside Confined Spaces shall conform to the provisions of Policy No. 28, Scaffolds.

Persons who enter Confined Spaces shall comply with the provisions of this Policy and the Confined Space Permit. This includes:

- Supervisors
- Inspectors
- Surveyors
- Observers
- Scaffold Builders
- Engineers
- Vendors
- Contractors, subcontractors, and other employers


Sources of ignition (e.g., flame, arc, or spark) shall not be permitted in any Confined Space until tests have ensured that the percentage of combustible/flammable gas or vapor is not more than zero (0) % of the Lower Explosive Limit (LEL).

5.8.2 Specific Duties

The following personnel have specific and defined duties during a Permit-Required Confined Space entry. Each must be properly trained to understand and fulfill those duties, and all training must be documented.

5.8.2.1 Attendant – The confined space Attendant shall:

- Know the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure;
- Be aware of possible behavioral effects of hazard exposure in Authorized Entrants;
- Continuously maintains an accurate count of Authorized Entrants in the Permit Space and ensures that the means used to identify Authorized Entrants accurately identifies who is in the Permit Space;
- Remains outside the Permit Space during entry operations until relieved by another Attendant
- Shall **NOT** enter the space and attempt a rescue unless they have been relieved by another Attendant and have been trained and equipped for rescue operations.


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- Communicate with Authorized Entrants as necessary to monitor Entrant status and to alert Entrants to the need to evacuate the space
- Monitor activities inside and outside the space to determine if it is safe for Entrants to remain in the space and orders the Authorized Entrants to evacuate the Permit Space immediately under any of the following conditions:
 - If Attendant detects a prohibited condition;
 - If Attendant detects the behavioral effects of a hazard exposure in an Authorized Entrant;
 - If the Attendant detects a situation outside the space that could endanger the Authorized Entrants; or
 - If the Attendant cannot effectively and safely perform all the duties required of them.
- Summon rescue and other emergency services as soon as the Attendant determines that Authorized Entrants may need assistance to escape from Permit Space hazards
- Take the following actions when unauthorized persons approach or enter a Permit Space while entry is underway:
 - Warn the unauthorized persons that they must stay away from the Permit Space;
 - Advise the unauthorized persons that they must exit immediately if they have entered the space; and
 - Inform the Authorized Entrants and Entry Supervisor if unauthorized persons have entered the space.
- Perform non-entry rescues as specified;
- Perform no duties that might interfere with the Attendant's primary duty to monitor and protect the Authorized Entrants.

NOTE: Attendants may be assigned to monitor more than one Permit Space provided the duties described can be effectively performed for each Permit Space that is monitored. Likewise, Attendants may be stationed at any location outside the Permit Space to be monitored as long as the duties described can be effectively performed for each Permit Space that is monitored.

If multiple spaces are to be monitored by a single Attendant, the Permit must include the means and procedures to enable the Attendant to respond to an emergency affecting one or more of the Permit Spaces being monitored without distraction from the Attendant's responsibilities.

5.8.2.2 Entry Supervisors – The confined space Entry Supervisors shall:


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- Know the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure;
- Verify, by checking that the appropriate entries have been made on the Permit, that all tests specified by the Permit have been conducted and that all procedures and equipment specified by the Permit are in place before endorsing the Permit and allowing entry to begin;
- Terminates the entry and cancels the Permit as required;
- Verify that rescue services are available and that the means for summoning them are operable;
- Remove any unauthorized individuals who enter or who attempt to enter the Permit Space during entry; and
- Determine, whenever responsibility for a Permit Space entry operation is transferred and at intervals dictated by the hazards and operations performed within the space that entry operations remain consistent with the terms of the Permit and that acceptable entry conditions are maintained.

5.8.2.3 Authorized Entrants – The confined space Authorized Entrants shall:

- Know the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure;
- Properly use equipment as required;
- Communicate with the Attendant as necessary to enable the Attendant to monitor Entrant status and to enable the Attendant to alert Entrants of the need to evacuate the space as required;
- Alert the Attendant whenever:
 - The Entrant recognizes any warning sign or symptom of exposure to a dangerous situation; or
 - The Entrant detects a prohibited condition; and
- Exit from the Permit Space as quickly as possible whenever:
 - An order to evacuate is given by the Attendant or the Entry Supervisor;
 - The Entrant recognizes any warning sign or symptom of exposure to a dangerous situation;
 - The Entrant detects a prohibited condition; or
 - An evacuation alarm is activated.

5.9 Emergencies

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5.9.1 Emergency Notification

It is the responsibility of the Entry Supervisor and/or the Entry Attendant to immediately notify the senior ATC employee on the worksite of a potential emergency by radio or cell phone. The senior ATC employee will assess the situation and contact emergency response personnel if applicable.

Only those individuals trained and certified in confined space entry procedures on the worksite may assist in emergency rescue operations.

5.9.2 First Aid/Medical Services

Refer to the requirements in Policy No. 20, First-Aid for specific worksite requirements.

5.9.3 Rescue/Retrieval Systems & Services


5.9.3.1 Rescue/Retrieval Systems

To facilitate emergency rescue, retrieval systems or methods shall be used whenever an Authorized Entrant enters a confined space, unless the retrieval equipment would increase the overall risk of entry or would not contribute to the rescue of the Entrant.

The Entry Supervisor, prior to the initial entry of personnel into a Confined Space, shall ensure the communication methods, rescue equipment, and retrieval systems are functioning properly.

Retrieval systems shall meet the following requirements to the greatest extent possible:

- Each Authorized Entrant shall use a full body harness with a retrieval lifeline attached at the center of the Entrant's back near shoulder level, or above the Entrant's head or safety coveralls with built-in harness, with a retrieval lifeline attached at the near shoulder level of the Entrant's back, or above the Entrant's head
- Wristlets may be used in lieu of the full body harness if the Entry Supervisor can demonstrate that the use of a full body harness is not feasible or creates a greater hazard and that the use of wristlets is the safest and most effective alternative
- The other end of the retrieval line shall be attached to a mechanical device or fixed point outside the confined space in such a manner that rescue can begin as soon as the rescuer becomes aware that rescue is necessary. A mechanical device

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shall be available to retrieve personnel from vertical type confined spaces more than 5 feet deep

- The safety harness shall be of the type that permits easy rescue of personnel from the confined space during emergency conditions and may be either the harness type that suspends a person in an upright position or the wrist type rescue harness. (A hoisting device or other effective means for lifting personnel from confined spaces is preferred)
- Lifelines shall have a minimum breaking strength of 5,400 pounds

5.9.3.2 Rescue Services

Where a rescue may not be possible using standard retrieval systems, due to the nature of the confined space or other considerations, additional assistance may be arranged with the Client. This may include use of their trained personnel who are familiar with the space, hazards, conditions, and access and egress to the space. If this is not feasible, then outside rescue services may be required.


In the case of outside rescue services, additional pre-planning is necessary to ensure that this service is available, that service personnel are properly trained and equipped (for the specific confined space and the specific hazards), and qualified to serve in this role. This means the rescue service has accepted responsibility to perform this service and has practiced rescues from comparable spaces, and under comparable conditions, at least every 12 months.

In these outside rescue service cases, the Regional Safety Coordinator must be directly involved in the planning process.

5.10 Completion of Work

When the work is completed in a confined space the following, as a minimum shall be completed:

- Tools, equipment and materials shall be removed;
- The space shall be inspected to ensure no personnel are inadvertently left in the confined space according to Policy 14, Energy Control;
- The area surrounding the confined space shall be clean of materials, equipment, scraps, and debris;

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- The Supervisor responsible for the confined space work shall inspect the work location to ensure cleanup of materials, tools, and other items is complete;
- (Lockout) locks are removed only when work is verified as completed.

Once completion of entry work has been confirmed as acceptable, the Entry Supervisor authorizes concluding the entry operations and canceling the Entry Permit.

5.11 Program Review

ATC will review entry operations when there is reason to believe that the measures taken under the ATC Confined Spaces Program may not be fully protective of employees and revise the Program as needed to correct any deficiencies before future entries are initiated.

Program reviews shall occur, using the cancelled Permits from the previous 12 month period (if entries occurred), each year. As needed, the ATC Confined Space Program will be revised to ensure on-going safety of personnel.

6.0 Appendices


10-01 – Confined Space Pre-Job Assessment Form

10-02 – Permit-Required Confined Space Reclassification Form

10-03 – Confined Space Entry Permit

7.0 References

- Occupational Safety and Health Administration (OSHA), 29 CFR Part 1910.146, Permit-Required Confined Spaces.

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Permit-Required Confined Space Reclassification Form

The following Permit-Required Confined Space has been reclassified as a "Non-Permit Confined Space". All hazards within the space have been eliminated.

LOCATION: _____

SPACE DESCRIPTION: _____

CERTIFYING EMPLOYEE : _____

Print Name
Signature and Date

Hazards Originally Existing in Space	Method of Eliminating Hazard	Verified By

TEST PERFORMED FOR ATMOSPHERIC HAZARDS (If Required)


Oxygen content greater than 19.5% and less than 23.5%

No Flammable gas or vapor levels present

Air contaminants do not exceed PELs

Employee Initials

This reclassification form shall be posted at the entrance to the confined space for the duration of the job or until conditions change to revert the space classification back to a permit-required space.

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Permit No. _____

Date of work: _____ Permit Valid From (Time): _____ to: _____ Project: _____

Location of Confined Space: _____

Scope of Work: _____

Reason for Entry: _____

Attendant: _____	Training Verified Yes No	Entry Supervisor: _____	Training Verified Yes No
Relief Attendant: _____	Yes No	Relief Entry Supervisor: _____	Yes No
Relief Attendant: _____	Yes No	Relief Entry Supervisor: _____	Yes No


Authorized Entrants	Training Verified	Authorized Entrants	Training Verified	Authorized Entrants	Training Verified
	Yes No		Yes No		Yes No
	Yes No		Yes No		Yes No
	Yes No		Yes No		Yes No
	Yes No		Yes No		Yes No
	Yes No		Yes No		Yes No

Pipelines isolated, blinded, air gapped, blocked	Yes NA	Fire Extinguishers & other equipment in place	Yes NA
Electrical lines & attachments deenergized, tried	Yes NA	Ventilation system in place and operational	Yes NA
Systems, vessels, lines drained, purged, cleaned	Yes NA	Rescue system in place and operational	Yes NA
Area secured, barricaded, posted	Yes NA	Lifelines and other fall protection equipment in place	Yes NA
Radioactive devices located and made safe	Yes NA	Lighting is explosion proof, 12 volt, approved type	Yes NA
Lockout/Tagout in place, systems tried	Yes NA	Protective clothing available at location	Yes NA
	Yes NA	Special PPE available at location	Yes NA
	Yes NA	Respiratory protection at site	Yes NA
	Yes NA	Other permits to perform work have been issued	Yes NA
	Yes NA	Rescue team or service notified of work commencing	Yes NA
	Yes NA	Sampling and testing equipment calibrated, tested	Yes NA
	Yes NA	Pre-entry testing and sampling is complete	Yes NA
	Yes NA	Circuit interrupters, ground fault system in place	Yes NA

Atmospheric Testing	Initial Readings	Instrument No. & Type	Tester Name
Oxygen – Must be from 19.5 to 23.5%			
Explosive Gases - Must be less than 10% of the LEL			

Toxic Gases - List Names	PEL	Must be Below PEL	Instrument No. & Type	Tester Name
Name:				
Name:				
Name:				
Name:				

Above readings are to be taken and recorded every _____ hours.

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Component	Time Reading	Time Reading	Time Reading	Time Reading	Time Reading	Time Reading	Time Reading	Time Reading	Time Reading	Time Reading
Oxygen										
Explosive Gas										
Toxic										
Toxic										
Toxic										

Name of Tester(s)	Substances Tested	All Substances

Brand of Instruments	Type / Model	Serial No., ID No.	Date Calibrated	Date Recalibrated

Type communication method to be used _____

Have all participants been advised of the potential hazards, systems, and consequences? _____

Rescue Method to be used _____

Provide of Rescue Operations: _____

Plant or Location Emergency Number: _____ Alternate No. _____

Other Client Permits or company Permits have been issued: _____ List: _____

All training required of individuals has been verified? _____ If No, Explain: _____

Emergency Telephone Numbers				
Fire Call		Ambulance Call		Rescue Call
Client Authorizing Person Name & Telephone No.				
Company Safety Contact Name & Telephone No.				


The Signatures below indicate all activities and requirements have been completed and authorization is given for work to commence.

Special instructions and conditions: _____

_____ Authorizing Supervisor
 Date Work Completed _____

_____ Authorizing Client Representative
 Time Completed _____

The attendant is responsible for maintaining this permit at the work location. The supervisor is responsible for returning this permit to the Branch Safety Officer when the work is complete.

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1.0 Policy

Employees who have been identified as having a predetermined risk of occupational exposure to Bloodborne Pathogens shall be provided with appropriate procedural precautions and training.

This Policy covers minimum performance standards applicable to all ATC Associates employees and locations. Local practices requiring more detailed or stringent rules, or local, state or other federal requirements regarding this subject can and should be added as an addendum to this procedure as applicable.

2.0 Purpose

To protect employees from occupational exposure to Bloodborne Pathogens and certain other potentially infectious materials.

3.0 Scope

Applies to all ATC office and work sites. (Note that applicability is limited to those few individuals whose job duties require them to have potential exposure to blood or other potentially infectious materials.)

4.0 Definitions

Approved Disinfectant - means a bleach/water solution in a ratio of 1:10 or any commercially available disinfectant such as Betacide or Madacide.


Blood - means human blood, human blood components and products made from human blood.

Bloodborne Pathogens - means pathogenic microorganisms that are present in human blood and can cause disease in humans. These Pathogens include, but are not limited to, Hepatitis B virus (HBV) and human immunodeficiency virus (HIV).

Contaminated - means the presence or the reasonably anticipated presence of blood or other potentially infectious materials on an item or surface.

Decontamination - means the use of physical or chemical means to remove, inactivate, or destroy bloodborne pathogens on a surface or item to the point where they are no longer capable of transmitting infectious particles and the surface or item is rendered safe for handling, use, or disposal.

Engineering Controls - means any controls that isolate or remove the bloodborne

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pathogens hazard from the workplace.

Exposure Incident - means a specific eye, mouth, other mucous membrane, non-intact skin, or parenteral contact with blood or other potentially infectious materials that result from the performance of an employee's duties.

First Responder (Mandatory or Voluntary) - means any employee who has received accredited training in First-Aid and/or Cardiopulmonary Resuscitation (CPR). A "Mandatory" First Responder is someone who, as part of their job duties, has been designated to render First-Aid/CPR assistance to persons who require emergency assistance while on company property or job sites. A "Voluntary" First Responder is someone who has been trained but whose job duties do not require them to render First-Aid/CPR. (Very few, if any, ATC employees will have First-Aid/CPR included as a required job duty.)

Hand-washing Facilities - means a facility providing an adequate supply of running potable water, soap, and single use towels or hot air drying machines.

HBV - stands for Hepatitis B virus.

HIV - stands for Human Immunodeficiency Virus.

Licensed Healthcare Professional - means a person whose legally permitted scope of practice allows him or her to independently perform the activities required by Hepatitis B Vaccination and Post-exposure Evaluation and Follow-up.


Occupational Exposure - means reasonably anticipated skin, eye, mucous membrane, or parenteral contact with blood or other potentially infectious materials that may result from the performance of an employee's duties.

Other Potentially Infectious Materials (OPIM) - means:

The following human body fluids: semen, vaginal secretions, cerebrospinal fluid, synovial fluid, pleural fluid, pericardial fluid, peritoneal fluid, amniotic fluid, saliva in dental procedures, any body fluid that is visibly contaminated with blood, and body fluids in situations where it is difficult or impossible to differentiate between body fluids;

Any unfixed tissue or organ (other than intact skin) from a human (living or dead); and

HIV-containing cell or tissue cultures, organ cultures, and HIV- or HBV containing culture medium or other solutions; and blood, organs, or other tissues from experimental animals infected with HIV or HBV.

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Parenteral - means piercing mucous membranes or the skin barrier through such events as human bites, cuts, and abrasions.

Responsible Person (Personnel) - means any person or persons trained in the control of disinfection procedures and disposal procedures of equipment, product or materials suspected to be contaminated with Bloodborne Pathogens.

Source Individual - means any individual, living or dead, whose blood or other potentially infectious materials may be a source of occupational exposure to the employee.

Universal Precautions- means an approach to infection control. According to the concept of Universal Precautions, human blood and certain human body fluids are treated as if known to be infectious for HIV, HBV, and other bloodborne pathogens.

Work Practice Controls - means controls that reduce the likelihood of exposure by altering the manner in which a task is performed.

5.0 Requirements


5.1 Exposure Determination

Job classifications shall be reviewed by the Branch Safety Officer to determine activities that involve potential occupational exposure to bloodborne pathogens or OPIM. Very few (if any) jobs at ATC will involve such exposure as part of a designated job duty. A list of these classifications as noted in 5.1.1 of this Policy shall be compiled and retained. Exposure determination shall be based on the definition of occupational exposure without regard to personal protective clothing and equipment. (For those involved in wastewater services, note that OSHA has issued an interpretation letter indicating that exposure to raw sewage does not constitute exposure to bloodborne pathogen hazards.)

5.1.1 Job Classifications With Possible Occupational Exposure

The first group includes job classifications in which all employees have occupational exposure. These job classifications shall be listed, although it is not necessary to list the specific work tasks of the people contained in this group (Refer to Appendix 09-01).

The second group includes job classifications in which some of the employees have occupational exposure. For these job classifications, it shall be necessary to list the specific tasks and procedures causing

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occupational exposure (Refer to Appendix 09-02).

Employees who serve as First Responders shall sign a First Responder Information Form. This form shall be maintained in the employee's personnel file (Refer to Appendix 09-03).

Any employee who has been identified as a Responsible Person shall be required to sign a Responsible Person Bloodborne Pathogen Exposure Control Statement. This form shall be maintained in the employee's personnel file (Refer to Appendix 09-04).

5.2 Training

Bloodborne Pathogen Exposure Control training shall be held within ninety (90) days of the effective date of hire, initially upon work site assignment, and annually for applicable employees. This training shall include employees who serve as Voluntary First Responders.

A copy of this Bloodborne Pathogens Exposure Control Program is available to all employees. It is posted at the ATC H&S web site and can be copied and provided in hard copy format to any employee requesting it.


5.3 Exposure Prevention

5.3.1 Universal Precautions

Employees shall adhere to the Universal Precautions method, that is, all human blood and OPIM shall be treated as if known to be infectious for HIV, HBV (Hepatitis B Virus), HCV (Hepatitis C Virus) or other bloodborne pathogens. Where differentiation of types of body fluids is difficult or impossible, all body fluids are to be considered potentially infectious and appropriate personal protective equipment shall be utilized. See Section 5.3.3 of this Policy.

5.3.2 Engineering Controls and Work Practice Controls

Engineering controls and work practice controls are to be the primary methods used to prevent occupational transmission of HBV and HIV. Engineering Controls reduce employee exposure at the work site by either removing or isolating the hazard or isolating the employee from exposure. Engineering controls shall be examined and maintained or replaced on a scheduled basis. Proper work practice controls change the manner in which a task is performed.

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Employees who come in contact with the blood of another person or other potential infectious materials shall wash their hands and any other skin with soap and water; if contact with eyes, mouth or nose, flush area with water immediately or as soon as possible following such contact. When hand-washing facilities are unavailable, employees shall use antiseptic cleanser and paper towels or antiseptic towelettes. Employees must know where the hand-washing facilities and other hand-washing supplies are located.


5.3.3 Personal Protective Equipment

If occupational exposures remain after instituting engineering and work practice controls, personal protective equipment (PPE) shall be used. PPE is considered appropriate only if it does not permit blood or other potentially infectious materials to pass through or reach employees' work clothes, street clothes, undergarments, skin, eyes, mouth, or other mucous membranes under normal conditions of use and for the duration of the time that the PPE shall be used.

Types of PPE include gloves, gowns, masks, mouthpieces and resuscitation bags. If the PPE is reusable, it shall be repaired, replaced and/or cleaned when necessary. ATC provides PPE for use by employees, including for response to first-aid type situations. This is through established large size first-aid kits at the Branch and portable first-aid kits for vehicles and project sites. All first-aid kits have appropriate PPE for minimizing contact with Bloodborne Pathogens. The items are PPE are provided at no cost to employees. Also refer to Policy No. 25, Personal Protective Equipment (PPE).

First Responders and Responsible Personnel shall have an Infection Protection Kit in their possession. Contents of an Infection Protection Kit should include the following items:

- Antiseptic Towelettes
- Rubber latex gloves
- Face mask
- Disposable body gown and shoe covers
- Protective eye wear
- Biohazard bag with secure tie
- Area Control Biohazard warning tape and signs

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Disposable PPE shall not be reused. If circumstances require the use of this equipment, it shall be properly disposed of after its use in the designated leak-proof (Bio-Hazard) container.

First Responders certified in CPR shall be provided with plastic mouth shields to protect a first responders' mouth area while performing Artificial Respiration or Cardiopulmonary Resuscitation (CPR).

First Responders and Responsible Personnel shall be required to use PPE when performing first aid on another person or decontaminating suspected contaminated equipment, products, or materials. It shall be the responsibility of each person rendering first aid assistance to use the appropriate degree of discretion and judgment necessary when deciding what type of PPE should be utilized for the given circumstances. However, when rendering immediate first aid to a bleeding person, First Responders shall use all appropriate PPE in their assigned Infection Protection Kits that offer protection from blood. If the First Responder makes a judgment in a given circumstance, that the use of PPE shall impede the delivery of first aid treatment or pose an increased hazard to the safety of the injured person or other employees, this judgment shall be documented.

5.3.4 Housekeeping


Any surface that has been exposed to potentially infectious materials shall be decontaminated.

5.4 Vaccinations

Hepatitis B vaccinations shall be made available to employees who have occupational exposure to blood within 10 working days of applicable work site assignment, at no cost, at a reasonable time and place, and under the supervision of a licensed physician/licensed healthcare professional, and according to the latest recommendations of the U.S. Public Health Service. (Refer to Appendix 09-05).

Employees identified as Mandatory First Responders or Responsible Persons, shall be immediately eligible to be prescreened for the presence of Hepatitis B virus antibodies and to receive a Hepatitis B Vaccine at no cost to the employee within ten (10) working days of their designation as a First Responder or Responsible Person. Employees who decline a Hepatitis B vaccination shall sign a Hepatitis B Vaccination Declination Form (Refer to Appendix 09-06).

Employees shall be provided with a copy of the medical provider's written report

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within fifteen (15) working days of receipt.

If the U.S. Public Health Service recommends a routine dose(s) of Hepatitis B vaccine at a future date, such booster dose(s) shall be made available at no charge.

5.5 Exposure Incidents


An exposure incident may occur if an employee comes into contact with the blood of another person or some other potentially infectious material. If any exposure incident occurs, the senior ATC employee shall ensure that the area and/or equipment that has been contaminated by blood or other potentially infectious materials is secured from inadvertent exposure to others by placing warning tape and signs around the contaminated area. Signs shall not be removed until the area is thoroughly cleaned and disinfected with disinfectant solution by a Responsible Person wearing appropriate Personal Protective Equipment.

The senior ATC employee shall document the incident on the Blood and Body Fluid Exposure Report (Reference to Appendix 09-07).

When any employee is subject to an exposure incident, regardless of whether or not that employee is a designated First Responder, the senior ATC employee shall:

- Immediately refer that employee to the designated medical provider;
- Ensure that the employee subjected to the exposure incident receives a confidential medical evaluation and follow up;
- Provide the designated medical provider with a copy of the completed Blood and Fluid Exposure Report as soon as possible following the investigation of the exposure incident;
- Request the source individual voluntarily submit to serological blood test to screen for the presence of Hepatitis B (HBV) and human immunodeficiency (HIV) virus antibodies (Reference to Appendix 09-08). If the source individual agrees to be tested, the person shall be directed to the designated medical provider;
- Request the source individual provide the medical provider for the employee subjected to the exposure incident the results of blood tests conducted on the source individual;

If the source individual refuses to voluntarily submit to blood testing, advise the medical provider that the source individual refused to be tested, and document with Blood Testing Consent/Non-Consent Form (Refer to Appendix 09-08).

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If the source individual declines a blood test to determine the presence of human immunodeficiency (HIV) virus antibodies, but does give consent for a blood test to determine the presence of Hepatitis B (HBV) antibodies, the medical provider shall be instructed to retain the source individual's blood sample for a period of ninety (90) days following the date the source individual's blood was drawn. The source individual may elect to have a blood test to detect HIV antibodies at a later date, in which case the medical provider can use the original sample provided by the source individual.

Request that the medical provider send a written report to the company documenting that the employee subjected to the exposure incident was informed of the medical evaluation results and the need for any further follow up. A copy of the medical providers report is given to the employee subjected to the exposure incident shall be provided a copy of the medical provider's report within fifteen (15) days after receipt.


Post-exposure evaluation and follow-up plus laboratory tests conducted shall be available, in confidence, to each employee who has had an exposure incident. The evaluations and test shall be conducted by an accredited laboratory and provided at no cost to the employee. Follow-up shall include a confidential medical evaluation documenting the following information:

- Circumstances of the exposure
- Identifying and testing the source individual, if feasible
- Testing the exposed employee's blood if he/she consents
- Post-exposure prophylaxis
- Counseling and evaluation of reported illnesses

5.6 Contaminated Materials and Labeling

Any disposable contaminated materials shall be discarded by sealing within a plastic bag, which is then to be sealed in a red bag or one that is marked with a "Bio-Hazard" symbol.

Proper disposal of these items shall occur by coordinating with a local waste disposal company. Disposal of these items without such coordination is prohibited.

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Work areas that contain processes where occupational exposure is known shall be marked with the biohazard symbol and include: Warning Biohazard Area.

The senior ATC employee for the applicable work area, or designee, shall ensure proper disposal.

5.7 Recordkeeping


The Branch Safety Officer or his/her designee will be responsible for maintaining all documentation and records related to the Bloodborne Pathogen Program. Exposure and medical records shall remain confidential and be maintained for thirty (30) years past the exposed employee's last date of employment, as follows:

- The name and social security number of the employee
- A copy of the employees HBV vaccination status, including the dates of vaccination
- A copy of the results of examinations, medical testing, and follow-up procedures
- A copy of the information provided to the healthcare professional, including a description of the employee's duties as they relate to the exposure incident, and documentation of the routes of exposure and circumstances of the exposure

Training records, such as those from hands-on first-aid/CPR training or the ATC web-based training courses, shall be maintained and kept for three years from the date of training. Other documentation of this training is acceptable when multiple topics are covered. The following information shall be included with the documentation:

- The dates of the training sessions
- An outline describing the material presented
- The names and qualifications of persons conducting the training
- The names and job titles of persons attending the training sessions
- Training records shall be available to employees or employee representatives upon request

The Branch Safety Officer shall provide to any employee, Assistant Secretary and/or OSHA Director who so requests, a copy of the Bloodborne Pathogen Exposure Control Program and/or related applicable information / records no later than fifteen (15) working days from the date of a written request. A release

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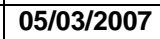
of employee medical records must include the specific written consent of the employee.

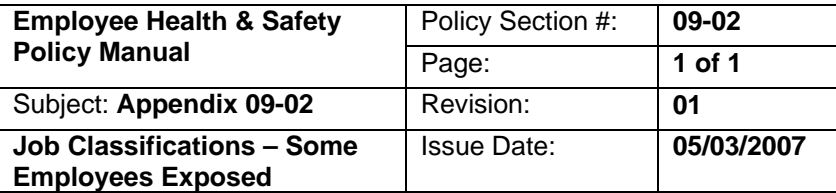
6.0 Appendices


- 09-01** - Job Classifications in Which All Employees Have Occupational Exposure
- 09-02** - Job Classifications in Which Some Employees Have Occupational Exposure
- 09-03** - First-Responder Information Form
- 09-04** - Responsible Person's Bloodborne Pathogen Exposure Control Statement
- 09-05** - Hepatitis B Vaccine Approval Form
- 09-06** - Hepatitis B Vaccine Declination Form
- 06-07** - Blood and/or Body Fluid Exposure Report
- 09-08** - Blood Testing Consent/Non-Consent Form

7.0 References

- Occupational Safety and Health Administration (OSHA), 29 CFR Part 1910.1030, Bloodborne Pathogens.

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[illegible]

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	Subject: Appendix 09-03	Revision:	01
	First Responder Information	Issue Date:	05/03/2007

First Responder Information Form

Name:		SSN:	
Division/Dept.:		Job Title:	

1. First Aid Certification

Expiration Date:

County/State of Issue:

2. Cardiopulmonary Resuscitation Certification

Certificate Number:

Expiration Date:

Agency Issuing Certificate:

3. Emergency Medical Technician Certification

Certification Number:

Certificate Date:

Expiration Date:


County/State of Issue:

I am serving as a (check one): _____ Voluntary First Reponder _____ Mandatory First Responder

As a First Responder, I understand that I may be exposed to blood or Bloodborne Pathogens during the course of providing immediate first aid assistance to others. In accordance with OSHA regulations I have received a copy of the Bloodborne Pathogen Exposure Control Program. I have had an opportunity to review Universal Precautions and if applicable, the Exposure Control Program, and I am familiar with all provisions to reduce my risk of exposure to blood and Bloodborne Pathogens.

I understand that I will receive no special monetary or material compensation for my services as a First Responder. If I am serving as a Mandatory First Responder I understand that this role is a requirement of my job. If I am serving as a Voluntary First Responder I understand that I may withdraw my consent to act as a Voluntary First Responder at any time by providing written notice to my supervisor.

Signature:		Date:	
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	Subject: Appendix 09-04	Revision:	01
	Responsible Person's BBP Exposure Control Statement	Issue Date:	05/03/2007

Responsible Person's Bloodborne Pathogen Exposure Control Statement

As a designated Responsible Person, I understand that in the course of work I may be requested to decontaminate equipment or facilities, or control materials contaminated with blood or other body fluids which could carry Pathogens capable of causing diseases including, but not limited to, Hepatitis B Virus (HBV) and human immunodeficiency virus (HIV). I have received training on control measures and have received and read the company Exposure Control Program.

I will use appropriate procedures and safe work practices to protect myself and my fellow workers from potential exposures to Bloodborne Pathogens.

Signature:		Date:	
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	Hepatitis B Vaccine Approval Form	Issue Date:	05/03/2007

Hepatitis B Vaccine Approval Form

I, _____, wish to receive a series of three vaccinations for Hepatitis B. The vaccine is prepared from yeast cultures and is free from association with human blood. I understand I must remain in the first aid room for observation for 15 minutes following the injection.

Employee Signature:		Date:	
----------------------------	--	--------------	--

Please Complete:

Known Medical Allergies:

Any known medical conditions:

(If the possibility of pregnancy exists, you must first discuss risks with your physician)

Injection #1 given:

--	--

(Date)

(Nurse's Signature)

--	--	--	--	--

(Lot #)

(Agent)

(Dose)

(Route)

(Site)

Injection #2 given:

--	--

(Date)

(Nurse's Signature)

--	--	--	--	--

(Lot #)

(Agent)

(Dose)

(Route)

(Site)

Injection #3 given:

--	--

(Date)

(Nurse's Signature)

--	--	--	--	--


(Lot #)

(Agent)

(Dose)

(Route)

(Site)

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	Hepatitis B Vaccine Declination Form	Issue Date:	05/03/2007

Hepatitis B Vaccine Declination Form

I understand that due to my occupational exposure to blood or other potentially infectious materials, I may be at risk of acquiring Hepatitis B virus (HBV) infection. I have been given the opportunity to be vaccinated with Hepatitis B vaccine at no charge to myself.


I decline Hepatitis B vaccination at this time. I understand that by declining this vaccine, I continue to be at risk of acquiring Hepatitis B, a serious disease. If, in the future I continue to have occupational exposure to blood or other potentially infectious materials and I want to be vaccinated with Hepatitis B vaccine, I can receive the vaccination series at no charge to me.

Name of Employee (print)

Employee Number

Signature of Employee

Date Signed

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	Blood & Body Fluid Exposure Report	Issue Date:	05/03/2007


Blood & Body Fluid Exposure Report

Employee Name:				Date of Birth:			
Last		First		MI			
SSN:			Employee #:			Dept. #:	
Job Title:							
Hepatitis B Vaccination status:		<input type="checkbox"/> Series complete		<input type="checkbox"/> In process		<input type="checkbox"/> Denied	
Injection Dates:		#1		#2		#3	
Date of Exposure:							
Date Exposure Reported:							
Time of Exposure (Approximate, if unknown):							
Responsible Person:				<input type="checkbox"/> Yes		<input type="checkbox"/> No	
Good Samaritan:				<input type="checkbox"/> Yes		<input type="checkbox"/> No	
Description of the Incident: (Include causes, where and how it occurred, and body parts involved.)							
Body Fluids Involved:				<input type="checkbox"/> Yes		<input type="checkbox"/> No	
Exposure was to:				<input type="checkbox"/> Non-Intact Skin		<input type="checkbox"/> Intact Skin	
Exposure source known?				<input type="checkbox"/> Yes		<input type="checkbox"/> No	
Consent obtained for HIV/HBV testing? (If yes, attach nameless copy of lab results to this form.)				<input type="checkbox"/> Yes		<input type="checkbox"/> No	
Indicate type of Personal Protective Equipment (PPE) used for this procedure:				<input type="checkbox"/> Glove		<input type="checkbox"/> Goggles	
				<input type="checkbox"/> Mask		<input type="checkbox"/> None	
				<input type="checkbox"/> Gown		<input type="checkbox"/> Other	
Was the PPE available for your use:				<input type="checkbox"/> Yes		<input type="checkbox"/> No	
				<input type="checkbox"/> Don't know		<input type="checkbox"/> N/A	
If NO, indicate why not:							
Referred to:				Phone:			
Additional Comments:							
Completed?		<input type="checkbox"/> Injury/Illness Report		<input type="checkbox"/> OSHA 300 Log			
		<input type="checkbox"/> First Report of Injury (Workers' Compensation Claim Form)					

Name of Preparer (print)

Title of Preparer

Date Form Completed

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	Blood Testing Consent Form		Issue Date:	05/03/2007

Blood Testing Consent/Non-Consent Form

Date of Exposure Incident:	
Hepatitis B Vaccination Status:	<input type="checkbox"/> Series complete <input type="checkbox"/> In process <input type="checkbox"/> Has not been vaccinated


I, _____, consent to being tested, as indicated below, for HIV and/or HBV. I understand that the results of this testing will be kept confidential and will be used to determine appropriate treatment for the individual exposed to my blood or body fluid.

Consent is given to be tested for:	
HIV (Human Immunodeficiency Virus)	<input type="checkbox"/> Yes <input type="checkbox"/> No
HBV (Hepatitis B Virus)	<input type="checkbox"/> Yes <input type="checkbox"/> No

(Employee Name)	(Employee #)	(Date)

I, _____, do not consent to any blood testing. The circumstances for the request to do so have been explained to me and I have no further questions or comments that need to be addressed as I make this decision. I understand that this denial will be kept confidential.

(Employee Name)	(Employee #)	(Date)

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1.0 Policy

Processes and systems shall be established and designed to ensure adequate communication and interactions among all levels of ATC employees. ATC will provide appropriate mechanisms and resources for employee awareness and communications, and the necessary training to ensure safe work environments and operations.

2.0 Purpose

To define systems and methods for the identification, control, and communication of potential hazards and the communication of job requirements, Company Policies, regulatory requirements, and work procedures.

3.0 Scope


Applies to all ATC Associates work sites, i.e., ATC offices, client job sites, etc.

4.0 Definitions

Anonymous Communications – There may be times when employees prefer to remain anonymous when communicating work observations or concerns. While direct communications with and employee's direct Supervisor is always preferred, ATC employees may utilize the Employee Assistance Program (EAP) hotline for anonymous communications. An example is to report a violation of a regulation or possible criminal act.

ATC H&S Site – means the web page dedicated to the ATC Health & Safety Program. This web site is a subset of the ATC Corporate web page. The H&S site is the primary source for Policies and procedures, H&S training and other resource information, and incident information, including hazard advisories and guidance materials for particular hazards.

Certification – means the act of providing documents and credentials for successful completion of a specific and detailed curriculum or training requirement. This is part of the process for some state-required regulatory training courses such as those required for licensed asbestos inspectors. It also covers those with professional designations, such as Professional Engineer (PE), Certified Industrial Hygienist (CIH), or Certified Safety Professional (CSP).

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Communication – means the process of exchanging information between two or more parties. This may include posting of materials, handouts to employees, discussions between management and employees, discussions between individual employees, and information exchanges through directed training materials.

Documentation – means the detailed record that demonstrates the completion of a training or communication requirement. For web-based training, this includes the date, time, score indicating employee met the criteria for successful completion of the training item, and an indicator for pass or fail. For some Instructor-Led Training (ILT), whether ATC internal or externally provided, the record should include the course specifics, instructor details (and in some cases credentials), date, time, and certification or score indicating successful completion of all requirements. For non-web-based training, documentation can be completed via the Training Documentation Form (refer to Appendix 08-04).


Employee Training – means the exchange of information necessary to properly and safely perform a given set of tasks. Training may be provided in a variety of methods, but generally includes: Instructor-Led Training (internal, external); Web-Based Training; and Field Training, which may include hands-on demonstration training.

Initial Training – means the training that is required prior to performing a work activity or working in an environment with a particular job or hazard exposure. Generally, where initial training is specified by a regulation, that training must be completed prior to those activities or exposures, or the employee must be directly and closely supervised until that training is completed.

Job Safety Analysis (JSA) - means a systematic process of studying a 'job' (task) so as to define the jobs steps (individual sequence of activities) associated with the job, identify the hazards or potential incidents associated with each sequential activity, and to develop solutions that shall eliminate, nullify, or prevent such hazards from causing harm.

Monthly Safety Meetings – means the meeting conducted at the Branch offices on a monthly basis that are designed to communicate specific safety information. These meetings are a forum for safety-related questions and answers in addition to a general exchange of safety information such as incidents and preventive methods, Behavior-Based Safety Program observations, hazard advisories, and individual Policy documents and requirements.

New Employee Orientation – means the initial training and communication process with an employee just starting their ATC employment. This process is an exchange of information about general employment issues, and about the ATC Health & Safety

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philosophy and specific H&S Program materials, documents, systems, processes, and procedures.

Refresher Training – means training that is required to be repeated on some identified frequency, such as annually. This is typically a requirement for regulatory-based training. For example, the Occupational Safety and Health Administration (OSHA) requirements for Respiratory Protection requires annual employee training.

Skillsets – means a collection of training items identified for a particular training need. You can have one or many individual training items in any given Skillset. When a Skillset is assigned to a given Learner, all the training items within that Skillset are automatically assigned.

Tailgate Safety Meeting – means a structured meeting that is conducted at a project site to discuss specific Health & Safety issues related to that site, site activities, and the personnel (ATC and/or Subcontractor) involved in site work activities. Tailgate Safety Meetings are conducted at the beginning of each workday when two or more ATC and/or Subcontractor employees are present on-site.

ToolBox Talks – means a short duration general discussion about a specific subject covering work activities or potential exposures. These are typically covered via a single-page document that is concise and to-the-point. Example topics include: Drum Handling, Eye Protection, and Lifting & Back Safety. These may also be referred to as 5-Minute Safety Talks.

Training Evaluation – means the process of providing objective feedback on training provided. This helps an instructor or other provider better understand what went well during the training, as well as areas for future improvement. Training evaluation can be completed the Training Evaluation Form (refer to Appendix 08-05).


Training Item – means an assignment for a Learner. This could be a document (DOC) to read, a Web-Based Training (WBT) course, or an Instructor-Led Course (ILT) such as an outside Asbestos Certification course.

5.0 Requirements

5.1 Communications & Training Overview

5.1.1 General

An effective Health & Safety Program is built upon a foundation of effective communications. Communications are used to transfer

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expectations at all levels of the organization, as well as the procedures, processes, and practices for meeting those expectations.

Communication is a two-way street. Management needs to communicate to employees, and employees need to communicate with management. When employees have a question about how to perform their jobs, the potential hazards of the job activity or work environment, or the required protective equipment, they should communicate directly with their immediate Supervisor or Project Manager.

ATC has established an environment in which free communication of information is encouraged. There are a number of “systems” or activities which enable communications, including but not limited to:

- New Employee Orientation
- New Employee Human Resources Web-Cast
- Monthly Safety Meetings
- Site Communications & Training
- Tailgate Safety Meetings


Each Policy in this Manual will indicate training requirements, as applicable. Annually, and in conjunction with monthly safety committee meetings, there will be a systematic review of Policies and topics applicable to each Branch. In response to training needs identified during the monthly review, the Branch Safety Officer will help arrange training and track employee training status.

Training methods will vary based upon need, local requirements, regulatory requirements, client requirements, and availability of instruction tools and materials. Acceptable methods of training include verbal instruction, classroom lectures, use of video presentations, hands-on, computer-based and/or Internet-based interactive training.

Training at ATC is performed primarily to promote employee safety and a safe work environment for employees, subcontractors, and the general public. Employee training is also inferred by the Occupational Safety and Health Administration (OSHA) through the OSH Act (General Duty Clause) and directed by many of the individual OSHA Regulations.

5.1.2 ATC Learning Management System

ATC has an established Learning Management System. This system, referred to as “TrainingMine”, allows for the development of personal

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learner curriculums, assignment of individual training items, delivery of training via web-based courses or documents, tracking of training assignments and completion, and reporting of training status. The system also has provisions for assigning and tracking completion of external training assignments, such as state-licensing required training courses or seminars.

The TrainingMine system allows for a curriculum to be assigned for an individual employee. The curriculum may include a number of “Skillsets” which are a collection of individual training assignments related to that Skillset. An example is Human Resources (HR). Any HR related courses that are required for employees would be included the HR Skillset. When a Skillset is assigned to a given employee, any new training items added that Skillset are automatically assigned to all employees who have been assigned that Skillset. A listing of current TrainingMine Skillsets and the individual training items included in each is available at the ATC H&S web site, under the Topic Library (Hot Topics).

Each Branch has at least one identified TrainingMine Administrator. The Administrators add new employees to the system, and complete the assignment of Skillsets and individual training items. Each Regional Safety Coordinator is a “System Administrator” and can provide support as needed to the Branches.

TrainingMine has an established library of web-based training courses and other media. Some are more generic regulatory-based courses provided by TrainingMine while others are custom-developed materials specifically addressing ATC activities and requirements. For the more generic regulatory-based courses, the system may allow for pre-tests and completion of post-tests to “opt-out” of the full course. Where an individual employee can meet the passing criteria without full completion of all the course materials, that is an acceptable outcome. For some training items, “test-out” is not an option.

Individual training items, as assigned to employees, appear on the employee’s “DeskTop”. This is the main screen that an employee sees once they log in to the TrainingMine system. The system allows for reminders to be sent to employees in advance of training deadlines. The system also has features where primary and secondary supervisors are advised when employees have not completed training assignments by the established deadline.

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Training reports for an individual, a Branch, a Region, or for all ATC operations can be produced. There are template-based reports and others that can be quickly run or customized to meet a specific need.

For questions concerning the TrainingMine Learning Management System, contact your Branch Administrator or Regional Safety Coordinator.

5.2 New Employee Safety Orientation & Training

5.2.1 Program Overview


New employees shall receive initial Safety Orientation as indicated herein. Additional safety training specific to the employee's job duties shall be provided prior to exposure to subject job hazards, and as required by regulations. Safety orientation and training shall include a review of Policies and procedures outlined in this Manual to the extent such Policies and procedures are applicable to the employee's job duties.

Policy review may be phased in over time, provided that the employee is not exposed to job hazards or tasks without first having reviewed the applicable Policies and procedures, and completed the required training.

ATC's New Employee Safety Orientation process and on-going employee training program is based upon a master checklist that is customized by the Branch for each employee (refer to Appendix 08-01, Employee Safety Training Checklist).

The basic steps in completing the Safety Training Checklist are as follows:

- Review of the new employee's past work experience and training;
- Verification of current compliance with required regulatory training (initial training and annual refresher training) where appropriate (e.g., HAZWOPER, AHERA asbestos certification);
- Verification of medical evaluation;
- Completion of required general orientation training as defined herein; and
- Completion of job specific training as determined by the Supervisor or Branch Safety Officer.

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5.2.2 Program Responsibilities

The responsibility for compliance with this program at the local level may be shared by several people. The employee's **Supervisor** is responsible for ensuring that the Employee Safety Training Checklist is completed correctly and on a timely basis. However, the Supervisor does not necessarily have to conduct all of the Safety Orientation and training by themselves. Some or all of those duties may be assigned to the Branch Safety Officer, Office Administrator, or others as directed by the Branch Manager.

5.2.3 Initial Safety Orientation


New employees shall receive initial Safety Orientation, which includes safety information and materials relevant to that employee's duties and potential exposures.

When a new employee begins work, the Supervisor and/or Branch Safety Officer shall complete the Checklist with the employee, and verify that applicable elements of the Checklist are completed for that employee prior to exposure to subject job hazards, and as required by regulations.


After each indicated training item on the Checklist is completed, the employee is required to sign as having received and understood the training provided. Once all applicable sections are completed, the Checklist is to be forwarded to the Branch Safety Officer for final verification prior to filing in the employee's Branch personnel file.

Components of the initial Safety Orientation shall include the following:

1. The Supervisor or Branch Safety Officer shall review, with the employee, relevant Policies of the ATC Employee Health & Safety Policy Manual. Several of the initial Policies are applicable to all employees (these are pre-checked). Other Policies are to be identified (checked) and discussed as applicable to the employee's specific duties and exposures.
2. Show the employee how to access the electronic ATC Health & Safety Policy Manual at the ATC Health & Safety Intranet site (H&S Site): <http://team.atcassociates.com/ATCStaffSafety/>,
3. Ensure that the new employee has completed the web-cast provided by the ATC Human Resources Department. This HR web-cast has a summary of the H&S Program and systems.

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4. Have the employee complete the appropriate ATC web-based safety orientation program and other training items: (<http://atc.trainingmine.com/>). There is a choice of either “Administrative” or “Technical” Skillsets depending on the employee’s job duties.
 - a. **Administrative Employees** – DO NOT visit project sites; and
 - b. **Technical Employees** – DO visit project sites (even if infrequently, or for short duration).
5. Have the Branch Training Administrator assign the appropriate Skillsets to the employee. This will provide the basic courses. The Training Administrator must also assign any additional training items as required based upon the employee’s work activities, potential exposures, regulatory requirements, or ATC Policies.
6. The Supervisor or Branch Safety Officer shall also provide classroom, video, and/or hands-on training to compliment the web-based training where required by site specific health and safety requirements or regulations.
7. Explain to the employee the Branch Emergency Action Plan and procedures to follow in the event of a fire, tornado, medical, or other emergencies (refer to Emergency Preparedness, Policy No. 13). Discuss project- and site-specific emergency procedures as outlined in Health and Safety Plans (HASP) for sites at which the employee will work.
8. Review reporting procedures for incidents, including injuries, exposures, vehicle incidents, property losses, environmental incidents, Near-Miss events, and Hazard Recognition events (unsafe acts or conditions). These are spelled out at Incident Reporting & Investigation, Policy No. 51).
9. Prior to driving a vehicle on Company business, the employee shall:
 - a. Have a valid driver’s license;
 - b. Review ATC’s Vehicle Safety requirements (Policy No. 30);
 - c. Read and sign the Vehicle Policy forms and have their Motor Vehicle Record (MVR) reviewed to ensure it meets criteria; and
 - d. Complete the Driver Safety (Defensive Driving) course.
10. Employees exposed to hazardous materials shall complete the internet-based Hazard Communication training courses. In addition, these employees shall review the ATC Hazard Communication Program (Policy No. 21) and the local site-specific Addendum. The Supervisor and/or Branch Safety Officer shall provide additional site-specific training as required per Policy 21.

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5.3 Job & Site-Specific Employee Training

5.3.1 Job Specific Safety Training

In addition to the general safety orientation indicated above, the employee shall receive job-specific training. The Supervisor or Branch Safety Officer shall review job duties and potential exposures, review Federal/State/local regulations, and determine appropriate training requirements. The Supervisor or Branch Safety Officer shall arrange for training to occur prior to exposure to subject hazards and as required by regulations.


For existing employees (already having completed the Safety Orientation process), training is not completed. Training is an on-going process. Each year, during the annual performance appraisal process, the Supervisor (Manager) and the employee will be reviewing the past year and the year to come. They should actively and openly discuss job activities, personal and professional needs, and any training that is needed to meet their personal and professional goals.

During the review process, there should be agreement on what training is required, and when and how it will be completed. For some employees, this may include external seminars, conferences, or licensing training. For those with professional certifications, on-going education is a requirement to maintain that certification.

In the case of employees needing the ability to work in areas other than normally assigned project activities, the Supervisor or Project Manager needs to address cross-training issues as well. In these cases, the Supervisor or Project Manager needs to identify the skills and training needed for the work activities and compare that with training currently assigned to that employee. The gaps in training then need to be identified and filled.

For documenting this evaluation process for training, the ATC Training Selection Checklist (refer to Appendix 08-02) can be used. For external training, simply list the courses and providers, along with the targeted completion dates and actual completion dates.

For externally provided courses, documentation needs to be provided by the employee to the Branch Training Administrator. This documentation will be used to manually provide credit for that training in the Learning Management System. By doing this, all of the employee training, both

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internally as well as externally provided, can be tracked in one central system.

5.3.2 Site-Specific Safety Training

This training is in addition to the initial Safety Orientation and training indicated above, and is applicable when an employee is first assigned to a new job site. This training consists of a review of the Health and Safety Plan (HASP) and specific site requirements, Client requirements, and other standards that apply uniquely to the work site.

5.4 Hazardous Waste Sites


5.4.1 Field Operations Training

Employees conducting hazardous waste site field activities must complete an initial 40-hour training course meeting the requirements of OSHA's Hazardous Waste Operations and Emergency Response (HAZWOPER) regulation (29 CFR Part 1926.65) before they are permitted to engage in hazardous waste operations that could expose them to hazardous substances, safety, or health hazards. Such field activities include, but are not limited to, underground storage tank investigation and remediation, environmental site assessments involving potential exposure to hazardous situations or chemicals, and any other projects involving hazardous chemical sampling or remediation.

HAZWOPER training shall be comprised of lectures, practical written exercises, and hands-on workshops including actual dress-out simulations in Level B and C protective equipment and clothing.

The training shall include the following:

- Names of personnel and alternates responsible for site safety and health;
- Safety, health and other hazards present on the site;
- Use of Personal Protective Equipment (PPE);
- Work practices by which the employee can minimize risks from hazards;
- Safe use of engineering controls and equipment on the site;

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- Medical surveillance requirements, including recognition of the signs and symptoms which might indicate overexposure to hazards;
- The contents of site Health and Safety Plan (HASP);
- Work Zones and Site Control;
- Decontamination;
- Instrumentation and Air Monitoring;
- Health and Safety Plans;
- Emergency Procedures;
- Confined Space Entry;
- Trench and Excavation Safety;
- Temperature Stress;
- Electrical Safety;
- Final Written Examination.


In addition to the 40-hour classroom instruction, ATC employees shall receive a minimum of three (3) days of practical field experience under the direct supervision of a trained, experienced Supervisor.

On-site management and Supervisors directly responsible for, or who supervise employees engaged in hazardous waste operations shall receive at least eight (8) additional hours of specialized training at the time of job assignment on topics such topics as, but not limited to, ATC's Health & Safety Program and the associated employee training program, Personal Protective Equipment (PPE) program, spill containment program, and health hazard monitoring procedures and techniques.

5.4.2 Field Operations Refresher Training

ATC employees who perform hazardous waste site field activities are required to participate in an annual 8-hour refresher course that provides an overview of material presented in the 40-hour course.

For questions concerning HAZWOPER training, contact the Regional Safety Coordinator.

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5.5 Site Communications & Training

5.5.1 Subject Specific Training (ToolBox Talks)

At sites where ATC is engaged in regular (daily or near daily) operations a “Toolbox Talk” safety discussion shall be held at least weekly to review with employees a safety subject relevant to current work site activities and exposures. Documentation of the Toolbox Talk shall be retained (refer to Appendix 08-03, Training Documentation Form).

Office, shop, warehouse employees, and drivers shall meet monthly to review a safety subject relevant to current operations and exposures.

A number of Toolbox Talks are posted at the ATC H&S site.

5.5.2 Tailgate Safety Meetings

A Tailgate Safety Meeting must be conducted at the beginning of each workday when two or more ATC/Subcontractor employees are present on-site. Employees, Client representatives, and Subcontractors who arrive at the site after the Tailgate Safety Meeting has been conducted, must be briefed on the topics covered.


Specific items of discussion for Tailgate Safety Meetings include specific hazards anticipated for that day, equipment operations, unusual activities, and any items identified through the inspection of the site using the Site Safety Checklist. Additionally, any previous site incidents, or incidents common to a comparable site, should be reviewed.

All Tailgate Safety Meetings must be documented. All participants attending the start of work meeting, as well as those arriving after that meeting, must sign-off indicating full understanding of the topics covered.

5.6 Safety Committees

5.6.1 General

Each Branch office shall establish a Safety Committee. The Woburn Branch office and Corporate office (and similarly-linked offices) may have a combined Safety Committee.

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Committees shall be comprised of employees and management representing the various work groups/areas at that location. An individual may represent more than one work group/area.

Committees shall designate a Chairperson (typically the Branch Safety Officer).

Meetings shall utilize a pre-developed agenda (refer to Appendix 08-06).

Committees shall meet on a monthly basis. Many Branches have monthly communication meetings for employees. At the discretion of the Branch Manager, the Safety Committee meeting may be combined with, and occur as a component of, employee communication and similar meetings.

Minutes shall be developed for committee meetings and the original shall be kept as part of the permanent records. Attendance at all employee communications and committee meetings shall be documented.


Safety Committee minutes shall be retained permanently or as otherwise specified in ATC's Document Retention Policy.

Safety Committee representatives shall serve on the committee for a minimum of 1 year.

5.6.2 Committee Activities

While varied according to local needs, Committee activities should include the following activities:

- Incident investigation review and analysis ;
- Workplace inspections to detect unsafe conditions or practices;
- Review of Behavior-Based Safety (BBS) Program observations and "At-Risk" Behaviors;
- Specific hazard advisories, as appropriate (based upon incident reviews);
- Safety training activity review;
- Safety recognition program review;
- Safety goal status review;
- Employee questions/suggestions;
- Recommendations for Policy enforcement actions; and
- Recommendations for location Policy Addendum for approval by management.

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5.7 Monthly Safety Meetings

5.7.1 General

Each Branch office shall conduct monthly employee safety meetings. These meetings are a process that allows for the exchange of safety information. It also allows an opportunity for employees to ask questions or make suggestions to help the overall H&S Program at the Branch.

In many regards, the monthly safety meetings are a Safety Committee approach by all employees at the Branch. The following items should be covered:


- Employee recognition for positive H&S activities;
- Feedback from questions/comments from previous meetings;
- Incident Reviews (summaries of cases from previous month), with Contributing Factors and Corrective Action discussions – focus on “High Value” learning events and incidents directly applicable to the Branch and its operations;
- Summary of Behavior-Based Safety (BBS) Program, including observations and “At-Risk” behaviors;
- Hazard Advisories, as appropriate;
- ATC Policies & procedures;
- Local issues; and
- Employee questions and comments.

5.8 Recordkeeping

5.8.1 General Requirements

Written records of safety processes outlined in this Policy, including written Branch-specific Addenda, shall be permanently maintained and retained by the Branch Safety Officer, or as otherwise specified in ATC’s Document Retention Policy.

Written records at remote work sites shall be maintained and retained by the senior ATC Associates employee or designee at the remote work site. If/when the remote work site activities cease, these records shall either be forwarded to the Branch Safety Officer or retained with work site files.

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5.8.2 Tracking Action Items

Where follow-up actions are required as a result of employee suggestions, questions, incidents, or work site inspections, adequate tracking must be established. This will ensure that action items are completed in a timely manner.


The ATC developed “Action Item Tracking System” should be utilized for all outstanding H&S action items. For questions about the Action Item Tracking System, contact the Regional Safety Coordinator.

6.0 Appendices

- 08-01** - Employee Safety Training Checklist
- 08-02** - Training Selection Checklist
- 08-03** - Training Skillsets
- 08-04** - Training Documentation Form
- 08-05** - Training Evaluation Form
- 08-06** - Safety Committee Meeting Documentation Form
- 08-07** - Tailgate Safety Meeting Form

7.0 References

- Occupational Safety and Health Act, Public Law 91-956, General Duty Clause.
- Training Requirements in OSHA Standards and Training Guidelines, OSHA Publication No. 2254, 1998 (Revised) –
<http://www.osha.gov/pls/publications/pubindex.list>

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Employee Safety Training Checklist

(For New Employee Safety Orientation & Annual Employee Training Plans)

Employee Name _____ Employee Number _____ Division _____
 Branch No. _____ Branch Location _____ Training Period Start Date: _____
 Client-Specific Training Requirements Apply? ☐ Yes ☐ No If YES, Client Name: _____

A. Pre-Employment Training Completed	Training Provider	Date Completed	Renewal Date
<input type="checkbox"/> HAZWOPER 40 hour	_____	_____	_____
<input type="checkbox"/> HAZWOPER 8-hr Refresher	_____	_____	_____
<input type="checkbox"/> AHERA Asbestos Inspector	_____	_____	_____
<input type="checkbox"/> AHERA Asbestos Inspector 4-hr Refresher	_____	_____	_____
<input type="checkbox"/> AHERA Asbestos Project Supervisor	_____	_____	_____
<input type="checkbox"/> AHERA Asbestos Supervisor 8-hr Refresher	_____	_____	_____
<input type="checkbox"/> _____	_____	_____	_____

Pre-Employment Training Verified by: _____
Print Name & Title Employee Signature Date

B. Baseline Medical Evaluation [Date Completed]

- ☐ Hazmat [_____]
- ☐ Asbestos [_____]
- ☐ Lead [_____]
- ☐ Respirator [_____]
- ☐ D.O.T [_____]
- ☐ Laboratory [_____];
- ☐ Combo [Check all that apply]

Baseline Medical Evaluation Verified by: _____
Print Name & Title Employee Signature Date

NOTE: Medical records are maintained at the local clinic in accordance with OSHA requirements (29CFR1910.1020).


C. Initial Safety Orientation – All New Employees: Safety orientation requirements are indicated below. Branch Safety Officer/Supervisor to review job duties/exposures and may require employee to take additional orientation training as indicated in Part D.

- BSO/Supervisor shall review with employee the location of and how to access relevant sections of the ATC Employee Health & Safety Policy Manual (Check applicable sections to be reviewed). Those items pre-checked are considered basic requirements and must be covered with ALL employees.

☒ 01 ☒ 02 ☒ 03 ☒ 04 ☒ 05 ☒ 06 ☒ 07 ☐ 08 ☐ 09 ☐ 10 ☐ 11 ☐ 12 ☐ 13 ☐ 14 ☐ 15
☐ 16 ☐ 17 ☐ 18 ☐ 19 ☐ 20 ☐ 21 ☐ 22 ☐ 23 ☐ 24 ☐ 25 ☐ 26 ☐ 27 ☐ 28 ☐ 29 ☒ 30
☐ 31 ☐ 32 ☐ 33 ☐ 34 ☐ 35 ☐ 36 ☐ 37 ☐ 38 ☐ 39 ☐ 40 ☐ 41 ☐ 42 ☐ 43 ☐ 44 ☐ 45
☐ 46 ☐ 47 ☐ 48 ☐ 49 ☐ 50 ☒ 51 ☐ 52

- ☒ ATC Safety Orientation (Choose one): ☐ Administrative Orientation or ☐ Technical Orientation
- ☒ Review of the Branch-specific Emergency Action Plan
- ☐ Review of the Branch-specific Hazard Communication Program
- ☒ Review of the Vehicle Safety Policy – Including completion of Vehicle Policy Agreement Forms
- ☒ Driving Safety course (All employees using personal, rental, or company owned or leased vehicles on company business)

Initial Safety Orientation Verified by: _____
Print Name & Title Employee Signature Date

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D. Job-Specific Safety Training – Current Employees: Safety training requirements for current employees must be evaluated on an annual basis, preferably as part of the annual Performance Review process. The Branch Safety Officer or employee's Supervisor should evaluate job duties and activities, potential job exposures (including those due to "cross-training" on different job activities), ATC Policies, and any Federal, State, or local regulatory requirements. Identify the training needed for the employee. Training must identify all course-work to be completed during the annual period.

The Checklist that follows (Appendix 08-02) includes all the currently available web-based Safety Training System courses. It also serves as a guide to selection of particular courses for job activities. Review this listing carefully to ensure all needed training is identified and completed by the employee. Where specific training is needed, but a course is not listed, provide the details as appropriate in the section after the Checklist.

Supervisors and Branch Training Administrators should also check the listing of "Skill sets" to confirm that all applicable Skill Sets (which including one or more individual training items) have been assigned to the employee.

NOTE: The Employee Training Selection Checklist (Appendix 08-02) must be attached to this document as part of the employee training record.

Job-Specific Safety Training Verified by: _____
Print Name & Title
Employee Signature
Date

E. Supervised Field Training (3 Days) ☐ Waived ☐ Completed Field Training supervision by: _____

Supervised Field Training Verified by: _____
Print Name & Title
Employee Signature
Date

Appendix 08-02

ATC Training Selection Checklist

Employee Name:	Employee No.:	Hire Date:
Branch Name:	Branch No.:	Division:
Client-Specific Training Requirements? <input type="checkbox"/> Yes <input type="checkbox"/> No	If YES, Client Names:	

NOTE: Use the "priority" column to indicate priority of course completion.

Priority #1 - Complete prior to work in area of exposure or within seven (7) days, whichever comes first. Includes "Client" reqs.

Priority #2 - Complete within thirty (30) days.

Priority #3 - Complete within ninety (90) days.

Priority #4 - Complete within the annual Performance Appraisal period (one year).

	Recommended Courses by Work Activity														
NOTE: For courses contained within a Skill Set, you do not have to individually assign these courses, just the Skill Set. Highlighted courses are ones included in one or more Skill Sets.	Select Course	Priority	Format Type	Refresher Freq.	GC-Geotechnical	EM-Drilling	MT-Materials Testing	CS-Construction Svcs	IF-Infrastructure	BS-Building Sciences	BS-Roofing	EM-Environmental Mgmt.	LB-Laboratory	TR-Training	AD-Administration
Orientation Skill Sets (Admin or Tech)		1													
Basic Safety Skill Sets (Admin or Tech)		1													
Human Resources Skill Set (All Employees)		1													
Client Requirements (COP) Skill Set		1													
Client Requirements (RELLC) Skill Set		1													
Drilling/GeoTechnical Skill Set		1													
DOT PHMSA Skill Set (Emp or Supervisor)		1													
Medical Surveillance Skill Set		1													
Supervisors & Managers (H&S)		1													
Current Listing of Training Items:															
Ammonia Refrigeration Hazards			WBT	36											
Asbestos (NIOSH 582 Sampling & Eval)			ILT	0									X		
Asbestos Awareness			WBT	12							X		X		
Asbestos Contractor/Supervisor Refresher			ILT	12											
Asbestos Inspector Refresher			ILT	12											
Asbestos Management Planner Refresher			ILT	12											
Asbestos Project Designer Refresher			ILT	12											
Asbestos Project Monitor Refresher			ILT	12											
ATC H&S Policy (All) (08/24/2006)			DOC	0	X	X	X	X	X	X	X	X	X	X	X
ATC H&S Program & Systems			WBT	36											
ATC Microbial Services Policies & Procedures			WBT	12											
ATC New Employee Orientation Process			ILT	0	X	X	X	X	X	X	X	X	X	X	X
ATC New Employee Orientation Process			WBT	0	X	X	X	X	X	X	X	X	X	X	X
ATC HR Orientation Webcast			ILT	0	X	X	X	X	X	X	X	X	X	X	X
Avian Flu Precautions			WBT	36											
Back Safety [1] (Tech)			WBT	36	X	X	X	X	X	X	X	X	X	X	X
Basic Corrosion			WBT	36											
Behavior-Based Safety Program (All)			WBT	0	X	X	X	X	X	X	X	X	X	X	X
Below Grade Safety			WBT	12	X		X	X				X			
Benzene			WBT	12											
Bloodborne Pathogens			WBT	12											
Butadiene			WBT	36											

Appendix 08-02
ATC Training Selection Checklist

NOTE: For courses contained within a Skill Set, you do not have to individually assign these courses, just the Skill Set. Highlighted courses are ones included in one or more Skill Sets.		Select Course	Priority	Format Type	Refresher Freq.	GC-Geotechnical	EM-Drilling	MT-Materials Testing	CS-Construction Svcs	IF-Infrastructure	BS-Building Sciences	BS-Roofing	EM-Environmental Mgmt.	LB-Laboratory	TR-Training	AD-Administration
Carbon Monoxide				WBT	36											
Centrifugal Pumps, An Overview				WBT	36											
Chemical Plant Evacuation				WBT	36											
Chemical Reactivity Hazards				WBT	36											
Cold Stress Awareness				WBT	24	X	X	X	X	X	X	X	X			
Computer Workstations				WBT	36											X
Confined Space (Permit-Required)				WBT	12	X		X	X		X		X			
Cutting Tool Safety - ATC (09-26-2006) (All)				WBT	12	X	X	X	X	X	X	X	X	X	X	X
Cyber Security Awareness				WBT	36											
Diesel Exhaust				WBT	36											
DOT - HazMat Security Awareness				WBT	36											
DOT - Marking & Labeling				WBT	36											
DOT - Packaging				WBT	36											
DOT - Placarding				WBT	36											
DOT - Regulatory Overview				WBT	36											
DOT - Shipments				WBT	36											
DOT - Shipping Papers				WBT	36											
DOT Drug & Alcohol Testing (Employee) [5]				ILT	12											
DOT Drug & Alcohol Testing (Supervisor) [6]				ILT	12											
Drawings: P&ID and PFD				WBT	36											
Drilling Safety				WBT	36	X	X						X			
Driver Safety [1] (Adm & Tech)				WBT	24	X	X	X	X	X	X	X	X	X	X	X
Electrical Safety				WBT	24		X	X	X	X	X		X	X		
Employee Access to Exposure/Medical Records				WBT	12	X	X				X		X	X		
EPA - Generator Container Management				WBT	36											
EPA - Generator Contingency Plan				WBT	36											
EPA - Generator Inspections				WBT	36											
EPA - Generator RCRA Regulatory Overview				WBT	36											
EPA - Generator Subpart BB				WBT	36											
EPA - Generator Subpart CC				WBT	36											
EPA - Generator Tank Management				WBT	36											
Hazardous Waste Awareness				WBT	36											
Ethylene Oxide				WBT	36											
Eye & Face Protection				WBT	24	X	X	X	X	X	X	X	X	X	X	
Fall Protection				WBT	24						X	X	X			
Field Hazards Recognition - Part 1				WBT	36									X		
Field Hazards Recognition - Part 2				WBT	36									X		
Fire Extinguishers				WBT	12	X	X	X	X	X	X	X	X			
Fire Safety				WBT	12	X	X	X	X	X	X	X	X			
First-Aid				WBT	24			X			X	X		X	X	X
First-Aid (AHA Certification)				ILT	24	X	X		X	X			X			
Flammable & Combustible Liquids				WBT	36		X		X				X			
Forklift Certification [2]				ILT	36											
Forklift Safety				WBT	36											
Hand & Power Tool Safety				WBT	24	X	X	X	X	X	X	X	X			

Appendix 08-02
ATC Training Selection Checklist

NOTE: For courses contained within a Skill Set, you do not have to individually assign these courses, just the Skill Set. Highlighted courses are ones included in one or more Skill Sets.

	Select Course	Priority	Format Type	Refresher Freq.	GC-Geotechnical	EM-Drilling	MT-Materials Testing	CS-Construction Svcs	IF-Infrastructure	BS-Building Sciences	BS-Roofing	EM-Environmental Mgmt.	LB-Laboratory	TR-Training	AD-Administration
Harassment & Discrimination (Employees)			WBT	0											
Harassment & Discrimination (Managers)			WBT	0											
Hazard Communication Awareness [1] (Tech)			WBT	24	X	X	X	X	X	X	X	X	X		
Haz-Com Material Safety Data Sheets (MSDS)			WBT	24	X	X	X	X	X	X	X	X	X		
HAZWOPER 40-Hour			ILT	0											
HAZWOPER 8-Hour Refresher			ILT	12											
HAZWOPER Awareness			WBT	12											
Hearing Protection			WBT	12	X	X	X	X		X		X			
Heat Stress Awareness			WBT	12	X	X	X	X	X	X	X	X			
Homeland Security			WBT	0											
Hydrogen Sulfide			WBT	12											
Incident Investigation			WBT	36											
Incident Reporting & Investigation (Part 1)			WBT	36											
Indoor Air Quality			WBT	36											
Indoor Cranes			WBT	36											
Industrial Hygiene, Introduction To			WBT	36											
ISO 9001: 2000 Standards			WBT	36											
JLG Lifts			WBT	36											
Job Safety Analysis (JSA)			WBT	36											
Job Site Safety			WBT	24											
Knife Safety			WBT	24											
Laboratory Safety Overview			WBT	36									X		
Ladders & Stairways			WBT	24		X	X	X	X	X	X	X			
Laser Safety			WBT	36											
Latex Allergy			WBT	36											
Lead Abatement Supervisor Refresher			ILT	12											
Lead Awareness			WBT	12											
Lead Inspector Refresher			ILT	12											
Lead Risk Assessor Refresher			ILT	12											
Lockout/Tagout			WBT	12				X		X		X			
Machine Guarding			WBT	24											
Medical Surveillance Exams (08/14/2007)			WBT	12	X	X				X		X	X		
Medical Surveillance Exams (08/14/2007)			ILT	12	X	X				X		X	X		
Methylene Chloride			WBT	36											
New Employee Orientation (Supervisors)			WBT	0											
NORM Awareness			WBT	36											
Office Ergonomics			WBT	24									X	X	X
Office Safety [1] (Adm)			WBT	24									X	X	X
OSHA, Introduction to			WBT	0											
OSHA 10-Hour Construction Safety			ILT	60											
OSHA Top 10 Violations (08/09/2006)			WBT	0											
Outdoor Cranes			WBT	36											
Personal Protective Equipment			WBT	12	X	X	X	X	X	X	X	X	X	X	
Poison Plants (09-29-2006)			WBT	36											
Process Safety Management			WBT	36											

Appendix 08-02
ATC Training Selection Checklist

NOTE: For courses contained within a Skill Set, you do not have to individually assign these courses, just the Skill Set. Highlighted courses are ones included in one or more Skill Sets.					Select Course	Priority	Format Type	Refresher Freq.	GC-Geotechnical	EM-Drilling	MT-Materials Testing	CS-Construction Svcs	IF-Infrastructure	BS-Building Sciences	BS-Roofing	EM-Environmental Mgmt.	LB-Laboratory	TR-Training	AD-Administration
Product Stewardship Overview			WBT	36															
Resource Conservation & Recovery Act			WBT	36															
Respiratory Protection			WBT	12										X		X	X		
Safety & Health Programs			WBT	24															
Safety Orientation [1] (Tech)			WBT	0	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Scaffolds (Overview)			WBT	24				X	X					X	X				
Security Threats (Overview)			WBT	36															
Self-Contained Breathing Apparatus (SCBA)			WBT	12															
Sexual Harassment Prevention (All)			WBT	0	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Silica - Hazards of			WBT	12															
Sprains & Strains			WBT	36	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Styrene			WBT	36															
Subcontractor Management (01/25/2007)			WBT	36															
Tailgate Safety Meetings (02/16/2007)			WBT	36															
Temporary Barricades			WBT	24															
Toxic Substances Control Act Section I (TSCA)			WBT	0															
Toxic Substances Control Act Section II (TSCA)			WBT	0															
Toxic Substances Control Act Section III (TSCA)			WBT	0															
Trackmobile Switching Safety			WBT	36															
Trenching and Excavation			WBT	24	X			X	X							X			
Trucks & Towing			WBT	36		X													
Voluntary Protection Program (VPP)			WBT	0															
Walking & Working Surfaces			WBT	24				X											
Welding, Cutting & Brazing Safety			WBT	24															
Work Zones in Traffic Areas			WBT	24		X										X			
Workplace Haz. Matls. Info System (WHMIS)			WBT	12															
Workplace Violence (Employees)			WBT	36															
Workplace Violence (Managers)			WBT	36															
Zero Energy Program			WBT	36															
Client Requirements (COP):																			
COP Incident Reporting (08-01-2006)			WBT	0															
Management Review (10-12-2004)			WBT	0															
Management Review (01-29-2005)			WBT	0															
Management Review (05-11-2005)			WBT	0															
Management Review (08-19-2005)			WBT	0															
RM&R Safety Message (2007)			WBT	0															
Near-Miss Reporting (COP RM&R) (11/17/2006)			WBT	0															
RM&R Safety Message - 1Q2007 (01/26/2007)			WBT	0															
RM&R Safety Message - 2Q2007 (06/14/2007)			WBT	0															
Subcontractor Management			WBT	0															
Client Requirements (RELLC):																			
Management Review (10-12-2004)			WBT	0															
Management Review (01-29-2005)			WBT	0															

Appendix 08-02

ATC Training Selection Checklist


NOTE: For courses contained within a Skill Set, you do not have to individually assign these courses, just the Skill Set. Highlighted courses are ones included in one or more Skill Sets.					Select Course	Priority	Format Type	Refresher Freq.	GC-Geotechnical	EM-Drilling	MT-Materials Testing	CS-Construction Svcs	IF-Infrastructure	BS-Building Sciences	BS-Roofing	EM-Environmental Mgmt.	LB-Laboratory	TR-Training	AD-Administration
Management Review (05-11-2005)							WBT	0											
Management Review (08-19-2005)							WBT	0											
RM&R Safety Message (2007)							WBT	0											
Near-Miss Reporting (COP RM&R) (11/17/2006)							WBT	0											
RM&R Safety Message - 1Q2007 (01/26/2007)							WBT	0											
RM&R Safety Message - 2Q2007 (06/14/2007)							WBT	0											

Total Courses:
Courses With Refreshers

29	31	29	30	23	32	25	36	28	17	15
22	24	22	24	17	25	19	29	21	9	8

NOTES:

- [1] Highlighted courses are included in basic Skill Sets (Orientation, Basic Safety, etc.). Check comment box at each Skill Set.
- [2] Forklift Certification needs to be Instructor-Led Training, with hands-on demonstration of driving skills.
- [3] ILT - Instructor Led Training. Requires documentation of completion - Admin manually enters date and "PASS".
- [4] DOC - Document (Requires reading & Understanding sign-off); WBT - Web Based Training (standard on-line course from Library).
- [5] DOT Drug & Alcohol Program (Employee) - Read document, return original signed form. Course specific to Department of Transportation, Hazardous Materials Safety Administration (PHMSA).
- [6] DOT Drug & Alcohol Program (Supervisor) - Complete video courset, return original signed form. Course specific to Department of Transportation, Hazardous Materials Safety Administration (PHMSA).

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	TrainingMine Skillsets	Issue Date:	12-01-2007

The following is a listing of “Skillsets” and the courses included in those Skillsets. When an Administrator assigns a given Skillset to a Learner, all the courses in that Skillset are automatically assigned. Additional Skillsets and courses in those Skillsets will be reviewed with management and this listing will be updated as needed. Contact your Regional Safety Coordinator with any questions. Some Skillsets apply to all employees, while others depend upon an employee’s specific job functions.

The major distinction in some of the Required Skillsets is whether an employee is an “Administrative” or “Technical” employee.

- Administrative Employees - **Do Not** visit project sites and therefore they are not exposed to project site hazards, client specific requirements, or regulatory and job-site requirements.
- Technical Employees - **Do** visit project sites (even if not routinely) and therefore they are exposed to project site hazards, client specific requirements, or regulatory and job-site requirements.

Required Skillsets (All Employees):

Orientation (Administrative): Applies to all new “Administrative” employees.

1. ATC H&S Policy (DOC)
2. ATC Orientation Process (WBT) – Summary of Orientation Process – [Future]
3. ATC Orientation Process (ILT) – Marker for completion of Checklist Process - [Future]

Orientation (Technical): Applies to all new “Technical” employees.


1. ATC H&S Policy (DOC)
2. ATC Orientation Process (WBT) – Summary of Orientation Process – [Future]
3. ATC Orientation Process (ILT) – Marker for completion of Checklist Process - [Future]

Basic Safety (Administrative): Applies to all ATC “Administrative” employees.

1. Office Safety
2. Driver Safety
3. ATC Behavior-Based Safety Program
4. Cutting Tool Safety
5. Fire Safety (Added 09/28/2007)
6. Fire Extinguishers (Added 09/28/2007)
7. Sprains & Strains (Added 09/28/2007)

Basic Safety (Technical): Applies to all ATC “Technical” employees.

1. Driver Safety
2. Back Safety
3. Safety Orientation
4. Hazard Communication
5. Material Safety Data Sheets (Added 09/28/2007)
6. ATC Behavior-Based Safety Program
7. Cutting Tool Safety
8. Fire Safety (Added 09/28/2007)
9. Fire Extinguishers (Added 09/28/2007)
10. Hand & Power Tool Safety (Added 09/28/2007)
11. Heat Stress Awareness (Added 09/28/2007)
12. Personal Protective Equipment (PPE) (Added 09/28/2007)
13. Sprains & Strains (Added 09/28/2007)

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Human Resources: Applies to all ATC employees.

1. Sexual Harassment Prevention
2. ATC HR Orientation Web Cast (ILT) – Marker for completion of web cast - [Future]

Job-Specific Skillsets:

Medical Surveillance (Health Resources): Applies to all employees who are required to completed medical exam as part of job activities and regulatory requirements.

1. ILT – A marker for the actual clinic exam (removed by providing manual credit for exam w/date)
2. Medical Surveillance Exams (an brief overview of ATC Medical Surveillance Program)
3. Employee Rights of Access to Exposure/Medical Records

Client Requirements (COP): Applies to any employee performing on-site project work for COP (RM&R group).


1. COP Incident Reporting (07-05-2007)
2. Management Review (10-12-2004)
3. Management Review (01-29-2005)
4. Management Review (05-11-2005)
5. Management Review (08-19-2005)
6. RM&R Safety Message (2007)
7. Work Zones in Vehicle Traffic Areas
8. Near-Miss Reporting (COP RM&R)
9. RM&R Safety Message (1Q2007)
10. RM&R Safety Message (2Q2007)
11. RM&R Contractor Safety Handbook
12. Subcontractor Management

Client Requirements (RELLC): Applies to any employee performing on-site project work for Resource Environmental, LLC (a group representing several oil companies including ConocoPhillips, ExxonMobil, Chevron, and others). Our commitment to RELLC is to manage H&S at RELLC sites equivalent to COP process.

1. Management Review (10-12-2004)
2. Management Review (01-29-2005)
3. Management Review (05-11-2005)
4. Management Review (08-19-2005)
5. RM&R Safety Message (2007)
6. Work Zones in Vehicle Traffic Areas
7. Near-Miss Reporting (COP RM&R)
8. RM&R Safety Message (1Q2007)
9. RM&R Safety Message (2Q2007)
10. Subcontractor Management

DOT HAZMAT (Hazardous Waste): Applies to any employee involved in the preparation, paperwork, packaging, or shipping of a hazardous waste material (HazMat). An example is an employee packaging hazardous waste at a Client project site in preparation for off-site shipment.

1. DOT – Marking and Labeling
2. DOT – Packaging
3. DOT – Placarding
4. DOT – Regulatory Overview
5. DOT – Shipments

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6. DOT – Shipping Papers
7. DOT – HAZMAT Security Awareness
8. EPA – Generator Container Management
9. EPA – Generator RCRA Regulatory Overview

DOT HAZMAT (Other than Hazwaste): Applies to any employee involved in the preparation, paperwork, packaging, or shipping of a hazardous material (HazMat). An example is an employee packaging a free product sample meeting hazardous materials criteria in preparation for off-site shipment.

1. DOT – Marking and Labeling
2. DOT – Packaging
3. DOT – Placarding
4. DOT – Regulatory Overview
5. DOT – Shipments
6. DOT – Shipping Papers
7. DOT – HAZMAT Security Awareness

Drilling/GeoTechnical: Applies to any employee performing drilling work, and those employees who oversee drilling activities of subcontractors.


1. ATC Drilling Safety

DOT Pipeline (PHMSA): Applies to employees performing work activities in petroleum refining, distribution terminals, and pipelines. This group is regulated by the Pipeline and Hazardous Materials Safety Administration of DOT. They are in a stand-alone drug & alcohol testing program meeting the DOT PHMSA requirements.


1. ATC DOT Drug Policy, Employees (ILT) – Read & Understand document; signed form returned
2. ATC DOT Alcohol Policy, Employees (ILT) – Read & Understand document; signed form returned
3. ATC DOT Drug & Alcohol Policy, Supervisor (ILT) – Requires completion of video; signed form returned

Management/Supervisor H&S: Applies to all Managers, Project Managers, and Supervisors who supervisor employees (or Subcontractor employees) and who otherwise need Health & Safety training and awareness to properly manage work activities and promote safe work practices. This includes Branch Safety Officers, Site Health & Safety Officers, and Regional Safety Coordinators.

1. ATC H&S Program & Systems – Designed to provide an overview of the ATC Health & Safety Program and various systems and resources available. (Currently in development)
2. Subcontractor Management – Designed to help in the overall monitoring and management of project site health and safety, including use of Subcontractors at project sites.
3. Tailgate Safety Meeting Effectiveness – A guide to Tailgate Safety Meetings and methods for ensuring effective meetings are conducted.
4. OSHA Top 10 Violations – A course that identifies the top violations noted by OSHA. Makes Management more aware of what OSHA inspectors are finding so problems can be resolved.
5. Incident Reporting (Part 1) – An overview of the ATC Policy and procedures for reporting of incidents. Includes a minimal overview of the investigation process.
6. Incident Reporting (Part 2) – More detailed training on the formal incident investigation process, (Currently in development)
7. Supervisor’s Role in Orientation – A Guide to the ATC New Employee Orientation process, and the Checklist used in this process. Takes them step-by-step through the process and actions that need to be taken to make this critical process work properly.

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8. Effective H&S Management for Supervisors – A guide to increase awareness of the role of Supervisors in overall responsibility for H&S of employees, including key activities to promote safety in all work activities and demonstrate leadership for H&S Program. (Currently in development)
9. OSHA Ten Series – A series of courses designed to cover the basics of the OSHA 10-Hour Certification Program.

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	Training Documentation Form	Issue Date:	12-01-2007

Facility Name: _____ Date of Training: _____

Training Location: _____

Training Module or Description: _____


Training Category:
☐ Regulatory (Compliance) ☐ Corporate/Facility ☐ Developmental ☐ Optional

Training Instructor: _____ Total Training Time: _____ (Hours)

Description of Materials Used, Handouts & Location: _____

Employee Name (Printed)	Employee Signature	Job Title
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

Training Session Comments:

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	Training Evaluation Form	Issue Date:	12-01-2007

Your Name (Optional): _____ Date of Program: _____
 Training Program Name: _____ Location: _____

We would appreciate your candid responses to the following questions:

What did you expect to gain by attending this training (your objectives)? Met Objectives?
☐ Yes ☐ No

My overall reaction to this training is:

☐ Better than anticipated ☐ Met my expectations ☐ Less than anticipated

What would you have liked discussed in more detail? _____

The training information was:

☐ Directly applicable ☐ Useful (I should be able to use some of it)
☐ Valuable review ☐ A rehash of old ideas
☐ Too theoretical ☐ Other _____

The most valuable part of this training was: _____

The least valuable part of this training was: _____

Participant involvement in this conference was:

☐ Constant and enthusiastic ☐ Somewhat hostile at times
☐ Sporadic, but enthusiastic ☐ Conspicuously absent


My reaction to the instructor(s) is: _____

Facilities (Location, room, audiovisuals, refreshments, lunch): ☐ Good ☐ Fair ☐ Poor

Suggestions for future training topics?: _____

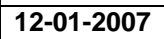
My overall comments are: _____


Thank you for your comments and suggestions. If you have additional comments, feel free to include them on the back of this sheet. We will consider all comments when planning future training programs.

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	Safety Committee Meeting Form	Issue Date:	12-01-2007

Date: _____ Time: _____ Location: _____

Item #	Topic	Responsibility	Action Date
1.	Call to Order	Chairperson	
2.	Attendance/Employee Safety Recognition – <i>Before the meeting, ask your managers for example of employees doing the right thing for safety.</i>	Chairperson	
3.	Previous Mtg. Minute Review	Chairperson	
4.	Injury/Incident/Near-Miss Statistics Review – <i>“Actively” discuss incidents from Master Listing of Incidents. Focus on “High Value” Learning Events and those directly applicable to your Branch</i>	Chairperson / Members	
5.	Follow-up (Old Business)	Various	
	a.) <i>As Applicable</i>		
6.	Sub Committee Reports	Various	
	a.) <i>As Applicable</i>		
7.	New Business		
	<i>a. Incidents Summary (Month, Yr)</i> <i>b. BBS Program Summary (Month, Yr)</i> <i>c. H&S News –</i> <i>d. Hazard Advisory:</i>		
	<i>e. Discuss local issues here</i>		
8.	Date, Time & Location of next meeting	Chairperson	

[illegible]

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	Subject:	Revision:	01
	Subcontractor Management	Issue Date:	07-05-2007

1.0 Policy

Subcontractors for ATC Associates (ATC) project sites shall be selected and managed in a manner consistent with ATC Associates safety objectives, Policies, and Procedures embodied in this Manual. As a result only subcontractors that have demonstrated a commitment to safety and have completed the requirements set forth in this Policy shall be approved to work on ATC project sites.

2.0 Purpose

To set forth a basis for the selection of safe subcontractors and to establish management procedures to assure that the subcontractor's activities are performed in a manner that are equal to or exceed the safety objectives of ATC.

3.0 Scope

This Policy applies to all ATC project sites, i.e., ATC offices, client job sites, etc., that have occasion to use subcontractors.


4.0 Definitions

Experience Modification Rate (EMR) - is a term related to Workers' Compensation insurance and means a rating developed by measuring the difference between an employer's past claim experience and the average experience of the industry classification of the employer. The EMR is based on a point scale where 1.0 means average losses for that type of industry classification. EMR's below 1.0 indicates average loss history is below industry average and EMR's above 1.0 mean average loss history is greater than industry average.

Hours of Exposure - means the total number of hours that all of a company's employees are exposed to occupational injuries or illnesses during a normal work year. Salaried and hourly employees are included. Straight-time and over-time hours are included.

Mentor - means a trained and experienced person who can assist in the on-site coaching, training and monitoring of personnel with limited project site experience or training. The Mentor helps ensure safety of that employee and helps them gain necessary and relevant experience.

Subcontractor - for purposes of this Policy, means a person or business, which has a standard subcontract agreement with ATC Associates, as an "independent contractor" (not an employee), to provide some portion of the field work on a project for ATC Associates.

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Vendor - means a company that contributes supplies or materials to an ATC project site or receives samples or other material from an ATC project site. Vendors do not have to be approved in the ATC On-line Subcontractor Pre-Qualification System.

5.0 Requirements

Subcontractors cannot be used on an ATC project site until all the requirements of this Policy have been completed. Branch Managers have the responsibility of ensuring that only subcontractors that have completed all the requirements in this Policy are used on ATC project sites.

To assist Branch Managers, Project Managers and Branch Safety Officers in the selection and management of subcontractors a Pre-Project Checklist has been developed which can be found in Appendix 05-01. The Pre-Project Checklist provides steps that should be completed prior to the start of the project to eliminate or reduce the health and safety hazards ATC and Subcontractor employees may encounter while working at the project site.


5.1 OSHA & EMR Data

Prior to any subcontractor working at an ATC project site the subcontractor must be **approved** in the ATC On-line Subcontractor Pre-Qualification System. If a subcontractor is not in the system then the ATC employee requesting the services of the subcontractor should have an email invitation sent to the subcontractor inviting them to complete an on-line pre-qualification questionnaire. The on-line pre-qualification system asks subcontractors to report OSHA exposure hours, number of OSHA recordables, compliance issues, and information about the subcontractor's health and safety program.

In most cases the Branch Manager, Branch Administrator, or Branch Safety Officer are authorized to send subcontractor invitations, approve subcontractors for work and access the ATC on-line system. The Branch Manager is ultimately responsible for approval of subcontractors. The system can be accessed through the ATC Company Intranet.

The safety performance of a subcontractor must be considered initially and annually thereafter. The Risk Management Department provides guidance criteria to help in the evaluation of subcontractors.

The subcontractor must submit specific OSHA and EMR data and answer questions related to H&S Program processes and activities. In several sections of the system, the subcontractor has the ability to upload documents related to

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	Subcontractor Management	Issue Date:	07-05-2007

their H&S Program.

Assistance can be sought for subcontractor approval by contacting your Regional Safety Coordinator, the Risk Management Group or by requesting assistance through the pre-qualification system.


5.2 Evaluation of the Subcontractor's Health & Safety Program

The prospective subcontractor shall demonstrate that their Program meets or exceeds industry and ATC standards. The on-line system provides a comprehensive list of questions related to Program elements. It is important to note and confirm that the subcontractor has the necessary Program elements for ensuring safe operation of a project site. The following areas shall be addressed by the subcontractor:

- The program should be industry specific, not generic, and should be responsive to the exposures prevalent in the industry and anticipated on the prospective project. If a subcontractor's program is not adequate, the subcontractor may use an ATC's Health and Safety Policy as their own or modify it to meet their needs. Prior to the sharing of ATC's Policies the subcontractor must complete the ATC Health and Safety Materials Acceptance Form found in Appendix 05-02.
- There should be elements of supervisor accountability for safety and incidents.
- Safety meetings should be held regularly, with documentation as to the subject, who attended, and a review of past incidents.
- Safety audits (inspections) should be conducted by the subcontractor on a regular basis. Audit results should be documented to identify deficiencies and corrective action taken.
- Equipment used for project work must be in good working condition and properly maintained. This includes the requirement for routine, documented inspections of equipment.
- The program should provide for documented employee safety training.

5.3 Miscellaneous Requirements

The subcontractor's safety performance and health and safety programs need to

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be evaluated based on the services the subcontractor will be providing for ATC. Additional, the ATC employee should determine if the subcontractor's safety performance and health and safety programs meet or exceed the Client's requirements.

5.4 Additional Approval Steps

A Master Service Subcontractor Agreement (MSSA) must be signed by all appropriate parties prior to the start of work. The MSSA contains important information about billing, insurance requirements and indemnification.


The understanding of ATC Associates and the subcontractor on important issues should be written and signed by both parties as part of the subcontract agreement and scope of work. Examples of such issues would be:

- Provision of tools and equipment and inspection thereof.
- Performance in accordance with OSHA and other regulatory bodies.
- Provision of all necessary PPE, training on its use, and enforcement of usage at the worksite.
- Responsibility for housekeeping and debris removal efforts.
- Responsibility for utility mark out, maintenance, and protection of traffic on underground and road projects during the project.
- Prior to work, a certificate of insurance must be secured from the subcontractor. Values of the insurance coverage shall be in accordance with the MSSA.

5.5 Working with Approved Subcontractors

5.5.1 General Requirements

Once a subcontractor is approved in the ATC On-line System, the subcontractor is approved to do work with any ATC Branch. However, the ATC employee requesting the services of an approved subcontractor approved by another Branch must verify that a MSSA and all appropriate accounting forms are completed. This can be done by contacting the Branch that approved the subcontractor.

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Currently, the online approval system is designed to approve subcontractors that have a H&S Program that meets or exceeds ATC H&S Policies and Programs. ATC Clients may have additional H&S requirements that must be verified prior to scheduling work with a subcontractor. ATC approval does not automatically mean a specific Client approval.


5.5.2 Subcontractor Requirements

ATC has developed a Subcontractor Safety Handbook that assists subcontractors in understanding the ATC H&S expectations. Appendix 05-03 contains the Handbook. Subcontractors should adhere to these basic principles:

- All injuries, losses and environmental releases are preventable and all ATC and Subcontractor personnel must work toward this goal.
- Subcontractor is responsible, without assistance from ATC Associates, for staying abreast of all regulations and accepted industry practices and complying with them regardless of the contents of the Handbook, which shall be considered **minimum** requirements for the Subcontractor to follow.
- All Subcontractor personnel have the responsibility to request, receive and understand training on the work they are conducting. The Subcontractor has the responsibility to be familiar with the jobs of the Subcontractor personnel and the training needed for those jobs, and to provide necessary training. In the performance of their assigned work, Subcontractor personnel are expected to do their work safely and follow correct operating procedures. This is a condition of the contract between the Subcontractor and ATC Associates.

5.5.3 Responsibilities for ATC Employee Managing a Subcontractor:

- Provide the ATC Subcontractor Safety Handbook to the subcontractor to review. Documentation of the review must be available.
- Obtain verification from the subcontractor that all subcontractor employees working on an ATC project site have received task specific training.
- Subcontractor should provide a Health and Safety Plan (HASP) for the project including Job Safety Analysis (JSA) for each routine hazardous

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task that will be performed by the subcontractor. In some instances a subcontractor will use the site specific HASP developed by ATC. However, the subcontractor should still provide JSAs to ATC.

- Determine the experience level of all subcontractor employees working on the ATC project site. Those subcontractor employees that have limited experience or knowledge of the task being performed must have a Mentor on-site assisting and routinely monitoring the subcontractor employee.
- Ensure that the subcontractor adheres to ATC's H&S Policies and Procedures and follow the subcontractor procedures.

5.6 Sharing ATC Health and Safety Policies

To assist subcontractors in developing or improving existing health and safety policies, they may use ATC's Health and Safety Policies as their own or modify to meet their needs. Prior to the sharing of ATC's Policies the subcontractor must complete the ATC Health and Safety Materials Acceptance Form found in Appendix 05-02.

6.0 Appendices


05-01 - Pre-Project Checklist

05-02 - ATC Health & Safety Materials Acceptance Form

05-03 - Subcontractor Safety Handbook (Reserved)

7.0 References

- Occupational Safety and Health Administration (OSHA), 29 CFR Part 1904, Recording and Reporting Occupational Injuries and Illness.

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	Pre-Project Checklist	Issue Date:	07-05-2007

The following checklist is intended to help an individual Branch or Project Manager prepare for first-time client project activities so they are properly prepared in advance of starting work. While this applies especially to clients such as ConocoPhillips (COP) or Resource Environmental LLC (RELLC) who have very high project site standards of performance and project safety expectations, it can be used for any clients.

Subcontractors:


Yes No N/A

- ☐ ☐ ☐ Will subcontractors be used?
- ☐ ☐ ☐ Have subcontractors been pre-qualified (ATC Vendor Prequalification System)?
- ☐ ☐ ☐ Have subs been trained on Client-specific H&S materials (examples: COP Contractor Safety Handbook; COP RM&R video, WalMart photo badges, etc.)?
- ☐ ☐ ☐ Have all subcontractors signed an MSSA and provided certificates of insurance, W-9 forms, and Vendor Classification Survey paperwork?
- ☐ ☐ ☐ Where subs will be using ATC Policies & Procedures, have these been communicated, are they understood, and has that been documented?
- ☐ ☐ ☐ Are subs aware of ATC Incident Reporting process?
- ☐ ☐ ☐ Do subs understand the concept of ZERO incidents?
- ☐ ☐ ☐ Do subs have the project materials needed, including Job Safety Analysis (JSAs) for specific activities to be performed?
- ☐ ☐ ☐ Are sub employees trained for general job activities? Are training records available?
- ☐ ☐ ☐ Where sub employees have limited work experience (e.g., less than 6 months), is a "Mentor" designated to coach and monitor that sub employee?
- ☐ ☐ ☐ Where sub employees will be operating motorized equipment, are they trained on that equipment? Are training records available?
- ☐ ☐ ☐ Have subcontractors read and signed-off on the Contractor Safety Handbook for Client (i.e., COP Contractor Safety Handbook)?
- ☐ ☐ ☐
- ☐ ☐ ☐

ATC Employees:

Yes No N/A

- ☐ ☐ ☐ Have ATC personnel been identified for project work?
- ☐ ☐ ☐ Have all employees completed New Employee Orientation (documented)?
- ☐ ☐ ☐ Do employees have experience with client requirements?
- ☐ ☐ ☐ Are there any particular qualifications for project site activities (i.e., OSHA 10-Hr, Hazwoper, Client site orientation, Client refinery training, etc.)?
- ☐ ☐ ☐ Do project site employees need to serve as "Competent Person" for any regulated project site activities (i.e., Trenching & Shoring, Confined Space Entry, etc.)?
- ☐ ☐ ☐ Are employees in the Medical Surveillance Program?
- ☐ ☐ ☐ Are Medical Surveillance Exams up-to-date and are clearance documents available?
- ☐ ☐ ☐ Are employees in Drug/Alcohol Testing Group (DOT Pipeline Hazardous Materials Safety Administration)?
- ☐ ☐ ☐ Has Driver Safety Training been completed?
- ☐ ☐ ☐ Have all driver Motor Vehicle Records (MVRs) been checked to confirm meeting criteria?
- ☐ ☐ ☐ Have employees completed respiratory Fit-Test?
- ☐ ☐ ☐ Are there any technical certifications (i.e., Asbestos Inspector)?

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ATC Employees: (Cont'd.)


Yes No N/A

- ☐ ☐ ☐ Are employees trained in basic first-aid, including CPR?
- ☐ ☐ ☐ Have employees completed awareness training for Bloodborne Pathogens?
- ☐ ☐ ☐ Are employees trained in fire protection (use of extinguishers)?
- ☐ ☐ ☐ Are employees trained for any special hazards (i.e., Hydrogen Sulfide exposure)?
- ☐ ☐ ☐ List the special hazards: _____
- ☐ ☐ ☐ Employees required to be trained in 40-Hour Hazwoper?
- ☐ ☐ ☐ Is employee 8-Hour Hazwoper training up-to-date?
- ☐ ☐ ☐ Where employees will package, label, move, or load hazardous waste at site for Client, are they trained in RCRA requirements?
- ☐ ☐ ☐ Is ATC Training for employees up-to-date?
- ☐ ☐ ☐ Are all appropriate Skill Sets identified, assigned, and courses completed?
- ☐ ☐ ☐ Are any client-specific (e.g., COP) Skill Sets assigned?
- ☐ ☐ ☐ Are all client-specific training courses up-to-date (complete)?
- ☐ ☐ ☐ Have employees completed training on PPE? Is it documented?
- ☐ ☐ ☐ Where IH monitoring is needed, are employees trained and qualified to use the identified monitoring equipment?
- ☐ ☐ ☐ Are employees aware of reporting structure (point-of-contact for communications within ATC)?
- ☐ ☐ ☐ Are employees aware of reporting structure (point-of-contact for communications to Client)?
- ☐ ☐ ☐ Are employees aware of reporting requirements for Unsafe Acts, Conditions, Near-Miss, or Incidents?
- ☐ ☐ ☐ Are employees aware of injury reporting & COMP-CARE injury assessment procedures?
- ☐ ☐ ☐
- ☐ ☐ ☐

ATC Project Managers:

Yes No N/A

- ☐ ☐ ☐ Is the Client contract requirements document spelling-out specific H&S requirements available to Project Managers?
- ☐ ☐ ☐ Have Project Managers completed review of the Client contract? Documented?
- ☐ ☐ ☐ Are Project Managers aware of the specific ATC incident reporting requirements (Policy No. 51)?
- ☐ ☐ ☐ Are Project Managers aware of the specific Client incident reporting requirements?
- ☐ ☐ ☐ Are Project Managers aware of the internal ATC reporting structure for key events (Policy No. 51)?
- ☐ ☐ ☐ Are Project Managers that visit project site meeting all requirements of site workers?
- ☐ ☐ ☐ Have Project Managers completed medical surveillance (if they will visit sites)?
- ☐ ☐ ☐ Have Project Managers completed the same training requirements as project site employees (if they visit sites)?
- ☐ ☐ ☐ Do Project Managers have same PPE as site personnel (if they visit sites)?
- ☐ ☐ ☐
- ☐ ☐ ☐

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Documents & Materials:


Yes No N/A

- | | | | |
|--------------------------|--------------------------|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Is there a Health & Safety Plan (HASP) for the project? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Has the HASP (Level 3) for unusual or large projects been reviewed by the Regional Safety Coordinator? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Is Traffic Management an integral part of the HASP? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Is there an ATC Job Safety Analysis (JSA) for each particular project activity? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Is there a Subcontractor Job Safety Analysis (JSA) for each particular project activity? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Have the JSAs been reviewed by the Site Safety Officer? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Are the Tailgate Meeting Forms available? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Who will conduct the Tailgate Safety Meetings? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Do project site personnel understand the Tailgate Safety Meeting requirements & process? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Is there a Site Safety Checklist Form available? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Who will perform the Site Safety Inspection? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Do project site personnel understand the Site Safety Checklist requirements & process? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Are there particular security and/or check-in procedures for access to site (people, vehicles)? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Are all project site (and subcontractor) personnel aware of the particular security and/or check-in procedures and do they understand them? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Have all project site personnel reviewed the Client Policies & Procedures (i.e., COP RM&R Contractor Safety Handbook) established as part of the project agreement? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Have you compared the Client Policies & Procedures to comparable ATC Policies & Procedures? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Are there any gaps between the Client Policies & Procedures and the comparable ATC Policies & Procedures? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Is there a Bridging Document to reconcile what Policies & Procedures will apply at the project site? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Is there an adequate supply of ATC Behavior-Based Safety (BBS) Program Observation Cards? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Is there an adequate supply of ATC Stop Work Cards? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Do all project site personnel have a Stop Work Card? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Do all project site personnel have readily available ATC Lifeline cards? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | If subsurface work is to be performed, has the "One-Call" service been contacted and is documentation available? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Does the HASP contain the ATC Checklist for Subsurface Clearance (Appendix 33-01)? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |

Equipment & Supplies:

Yes No N/A

- | | | | |
|--------------------------|--------------------------|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Is a cell phone available for emergency contact purposes? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Are there restrictions on use of cell phones at the project site? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | If there are restrictions on cell phones inside project site, have you identified alternative ways to communicate in event of emergency or project questions? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Is Personal Protective Equipment (PPE) provided & in good condition? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Have employees completed training on PPE? Is it documented? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Have minimum PPE requirements been established and communicated (for both ATC/Subs)? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | List minimum PPE requirements: _____ |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Are there any special PPE requirements (i.e., Nomex flame retardant clothing)? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Any special PPE needed (i.e., traction devices for boots – snow & ice conditions)? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Are there Industrial Hygiene requirements at project site, such as wearing of exposure badges? |

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Equipment & Supplies: (Cont'd.)


Yes No N/A

- ☐ ☐ ☐ Are any vehicles to be used for transport to/from project site in good condition?
- ☐ ☐ ☐ Do project site vehicles have DriverCheck decal in place?
- ☐ ☐ ☐ Is there a readily available portable fire extinguisher?
- ☐ ☐ ☐ Does the portable fire extinguisher meet requirements (annual certification tag, monthly safety inspections, good overall condition)?
- ☐ ☐ ☐ Is there a readily available first-aid kit?
- ☐ ☐ ☐ Does the first-aid kit meet requirements (approved contents, fully stocked)?
- ☐ ☐ ☐ Does first-aid kit include supplies for protection against Bloodborne Pathogens?
- ☐ ☐ ☐ Has consideration been given to work zone delineation?
- ☐ ☐ ☐ Identify required items for work zone delineation: _____
- ☐ ☐ ☐ Are any hazardous materials involved in the project?
- ☐ ☐ ☐ Where hazardous materials are utilized, is that use covered in the HASP and are MSDS readily available as an addendum to the HASP?
- ☐ ☐ ☐ Has notification been made to Client of any hazardous materials to be used?
- ☐ ☐ ☐ Has Client provided written authorization for hazardous materials?
- ☐ ☐ ☐ Are portable container labels available where needed for hazardous materials?
- ☐ ☐ ☐ Are monitoring devices needed for any potential exposures to hazardous materials?
- ☐ ☐ ☐ List monitoring devices needed: _____
- ☐ ☐ ☐ Motorized/powered equipment (including battery powered) – Approved for classified areas?
- ☐ ☐ ☐ Is fuel for motorized equipment maintained in “Approved” containers (plastic only allowed in one gallon size)?
- ☐ ☐ ☐ Have any tools or equipment to be used been reviewed for safety?
- ☐ ☐ ☐ Is the prohibition on Fixed Open Blade Knives (FOBKS) understood by all employees?
- ☐ ☐ ☐ Where FOBKS are needed for a particular activity, has the Client been notified in advance and have they provided a written variance for the cutter’s use at the project site?
- ☐ ☐ ☐ Is there an inspection process for any project site equipment (including extension cords, hand or portable power tools, ladders, air-knife, hydro-vac, etc.)?
- ☐ ☐ ☐ Is there an inspection process to ensure safe operations for mobile equipment (trenchers, backhoes, drill rigs, etc.)?
- ☐ ☐ ☐ Have site personnel confirmed with Subcontractor that inspections have been completed and documented?
- ☐ ☐ ☐ Has consideration been given to well vault lid opening/removal?
- ☐ ☐ ☐ Is appropriate equipment available for well vault lids (extension sockets for bolts, magnet handles for lifting lids)?
- ☐ ☐ ☐ Will any pressured processes be utilized, such as but not limited to, grouting, compressed air, air-knifing, etc.?
- ☐ ☐ ☐ Is inspection of pressurized equipment, hoses, and fittings part of project HASP and/or JSA?
- ☐ ☐ ☐ Are facilities available for flushing of eyes where needed (i.e., portable eye wash station)?
- ☐ ☐ ☐ Is an emergency spill kit needed for project work?
- ☐ ☐ ☐
- ☐ ☐ ☐

Work Practices:

Yes No N/A

- ☐ ☐ ☐ Client Project Site Orientation?
- ☐ ☐ ☐ General Work Permits for Project Site?
- ☐ ☐ ☐ Hazardous materials (HazCom)

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Work Practices: (Cont'd.)

Yes No N/A

- ☐ ☐ ☐ Sampling equipment for monitoring hazardous materials or physical hazards?
- ☐ ☐ ☐ Site Security – Entry to site; staging of vehicles/equipment; parking of vehicles?
- ☐ ☐ ☐ Does Client have general work permit system at site and are employees familiar with system?
- ☐ ☐ ☐ Work activities in or adjacent to active roadways?
- ☐ ☐ ☐ Hot Work?
- ☐ ☐ ☐ Lockout/Tagout of energy sources?
- ☐ ☐ ☐ Confined Spaces?
- ☐ ☐ ☐ Elevated Work?
- ☐ ☐ ☐ Trench/Excavation Work?
- ☐ ☐ ☐ Use of Motorized Equipment (i.e., JLG lifts, cranes, fork trucks, etc.)?
- ☐ ☐ ☐ Movement of vehicles/motorized equipment (spotters)?
- ☐ ☐ ☐ Hazardous Waste Involved?
- ☐ ☐ ☐ Drilling (Potential Hazardous Materials)
- ☐ ☐ ☐ Drilling (Non-Environmental)
- ☐ ☐ ☐ Housekeeping Considerations
- ☐ ☐ ☐
- ☐ ☐ ☐

Data:


Yes No N/A

- ☐ ☐ ☐ Are there Client reporting requirements for ATC & Subcontractor Exposure Hours?
- ☐ ☐ ☐ Is Project Manager aware of who to make reports to?
- ☐ ☐ ☐ When are data reports due to Client? _____
- ☐ ☐ ☐ Is good documentation available for employee review of key documents for Client and for project site (Contractor Safety Handbook; General Work Permit Requirements; Incident Reporting, etc.)?
- ☐ ☐ ☐
- ☐ ☐ ☐

Project Site Monitoring:

Yes No N/A

- ☐ ☐ ☐ Does project planning include consideration for monitoring of the project site environment initially and as needed during term of project?
- ☐ ☐ ☐ Who will conduct checks of the project site environment?
- ☐ ☐ ☐ Does project planning include consideration for monitoring of project site activities to ensure personnel are working safely?
- ☐ ☐ ☐ Who will conduct checks of the project site activities?
- ☐ ☐ ☐ Will Behavior-Based Safety (BBS) Program observations be made of ATC personnel?
- ☐ ☐ ☐ Will BBS Program observations be made of subcontractor personnel?
- ☐ ☐ ☐
- ☐ ☐ ☐

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	H&S Materials Acceptance Form	Issue Date:	07-05-2007

ATC Health & Safety Materials Acceptance Form

ATC and Subcontractor previously entered into a Subcontract Agreement which requires Subcontractor to be solely responsible for all matters relating to the health and safety of its personnel and equipment.

Subcontractor is requesting assistance with its Health and Safety Program and ATC has agreed to provide Subcontractor with ATC's Health and Safety Information for Subcontractor's use.


Subcontractor agrees that any use of ATC's Safety Information beyond its intended use or further distribution by Subcontractor shall be at Subcontractor's and recipient's sole risk and without any liability to ATC.

Subcontractor

Date

Signature

Name and Title

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	Subject: Work Zones in Traffic Areas	Revision:	01
		Issue Date:	12/12/2006

1.0 Policy

Work zones on project sites shall be maintained to provide a safe working environment for employees conducting ATC related activities, subcontractors, and the general public.

This policy covers minimum performance standards applicable to all ATC Associates employees and locations. Local practices requiring more detailed or stringent rules, or local, State or other Federal requirements regarding this subject can and should be added as an addendum to this procedure as applicable.

2.0 Purpose

To ensure the safety of ATC employees, subcontracted personnel and the general public during work related activities.

3.0 Scope

Applies to all ATC Associates work sites where work will be performed within vehicular or pedestrian traffic areas on private property or active public roadways.

4.0 Definitions

Traffic Area – The aggregation of vehicles and/or pedestrians coming and going in a particular area, paved or unpaved, outdoors or indoors, where potential for personal injury or property damage may occur as a result of that traffic. Does not include normal construction site traffic.

Elevated Work – Work that is performed at a height usually on a ladder or scaffold.


Traffic Control Plan – A plan describing the traffic controls to be used for facilitating vehicle and pedestrian movements through a temporary work zone setup in a public right of way.

Fully Enclosed Work Zone – A site that is surrounded on all sides by a work zone delineator, such as caution tape and cones, so as to control or prevent access in and out of the work area. A designated entrance and exit should be established prior to the beginning of operations.

Traffic Safety Vest – A piece of clothing made of bright colors and reflective material that allows workers to stand out and be seen while working in a work zone. There are three (3) classes of clothing:

- Class 1 – The lowest level of protection - used when the speed of the traffic will be less than 25 mph
- Class 2 – Used when workers are exposed to traffic speeds greater than 25 mph and work in inclement weather.
- Class 3 – The highest level of protection used for workers exposed to traffic speeds greater than 50 mph.

Work Zone Delineator - A specific device(s) used to alert or deter operators of motor vehicles, pedestrians, or unauthorized personnel from entering the designated work zone.

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Examples:

- Traffic Cones – Must have a total height of 40 inches; can be used with secondary device (flag) to achieve total height of 40 inches. Must be made of a highly visible color such as orange or yellow.
- Flags – Small orange flags used in conjunction with a standard traffic cone of smaller height used to obtain the 40-inch minimum height requirement.
- Vehicles - Use of a Vehicle to block traffic. NOTE: A vehicle can be used to substitute for two cones when setting up the four-corner method.
- DOT Devices - DOT Approved Signs, Plastic Drums or any other DOT-approved channelizing device as listed in the Manual on Uniform Traffic Control Devices.
- Temporary or Permanent Fencing – Could either be orange colored snow fence or chain link fence.
- Safety Barrier Tape – Vibrantly colored tape sometimes with words or slogans such as; Caution, Danger, Keep Out or Authorized Personnel Only.

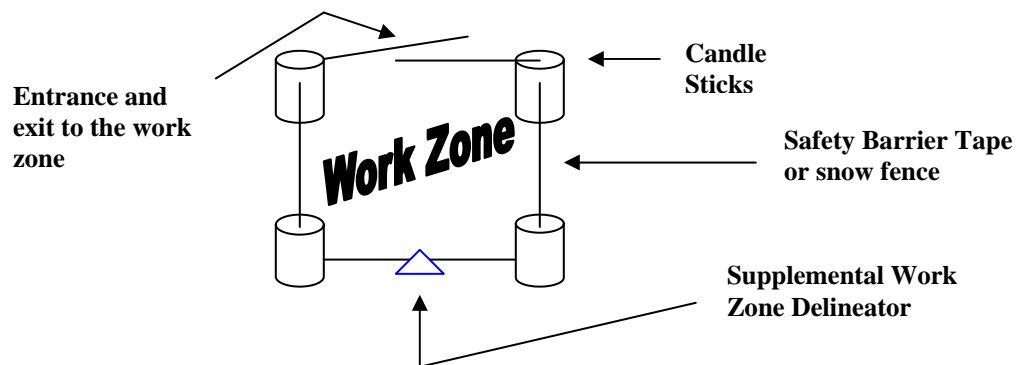
Work Zone – A designated area in which authorized ATC personnel, ATC subcontractors, and work related equipment would be stationed while performing job related activities.


5.0 Work Zone Requirements

5.1 General Work Zone Development Procedures

ATC Employees and ATC subcontractors working on a project site must designate a work zone at the beginning of site activities. Appendix 36-01 can be used to assist with the development of the work zone. Once employees and subcontractors have designated the work zone and set-up the work zone (if needed), work may commence.

Work zone must be established by using a four corner method: this means that each designated work zone must be fully enclosed by work zone delineators. This four-corner method could be as simple as using four (40 inch) traffic cones and caution tape setup in the shape of a rectangle. The work zone is then established as the area inside the work zone delineators.



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Additional work zone delineators may be necessary to further establish the work zone area. This might include adding additional supplemental delineators to the sides of the work zone filling in the space between the established four corners. This may be necessary in areas where the work zone has been designated as a large area due to the amount or types of equipment being used on that job site.

At a minimum, employees will establish this basic four-corner method to establish a safe work zone on sites with vehicular traffic areas (other than normal construction traffic) and when performing elevated work such as work on a ladder or scaffold. Additions to the work zone can be added based on-site specific conditions.

5.2 Vehicular Traffic Areas

Public Right of Way Work Zones - Prior to beginning any work in a public right of way the City, County, or State Agency in charge of the road in which work will be done must be contacted and informed of the work to be performed. Some agencies may require a permit to be obtained and a traffic control plan to be developed and submitted for approval.

A copy of the traffic control plan and approved permit must be kept onsite while work is performed.

Private Property Work Zones - Work performed on private property, such as parking lots; do not require a traffic control plan. Employees should use Appendix 36-01 to help determine the appropriate work zone setup.

5.3 Elevated work


Employees that need to be elevated while performing their work must adequately protect their work zone from vehicle or pedestrian intrusion.

For work in non-vehicular traffic areas employees should establish a work zone that prevents the public from being exposed to falling objects. This may be as simple as using a cone under a ladder to prevent someone from walking under the ladder or fully enclosing the work zone.

For any elevated work where there is a possibility for vehicular traffic, the work zone must be fully enclosed.

Employees working at inactive, abandoned properties or construction sites do not have to setup a work zone when working above ground.

In the event ATC employees use scaffolds, ladders or other equipment setup by a third party to perform elevated work, setup of a work zone is not required, unless site conditions or training dictates the need.

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6.0 Additional Requirements

While on the site, employees and subcontractors are required to follow ATC's site-specific Health & Safety Plan (HASP).

Daily tailgate safety meetings must be conducted and ATC safety protocols must be reviewed with relevant personnel including subcontractors.

All employees and subcontractors must wear a traffic safety vest when at a work site with vehicular traffic.

7.0 Secondary Measures and Controls


- Be alert and watch out for approaching vehicles.
- Use vehicles and large equipment to block traffic.
- Use the Buddy System at busy project sites.
- Avoid spending prolonged amounts of time in high traffic areas when possible.
- Whenever possible, avoid being low to the ground where drivers may not be able to see you.
- Use flyers placed on windshields indicating that workers are conducting activities around the vehicle.
- Try to avoid working during peak traffic hours.
- Use proper lighting when working in dimly lit situations.
- Try to avoid working in high traffic areas whenever possible.

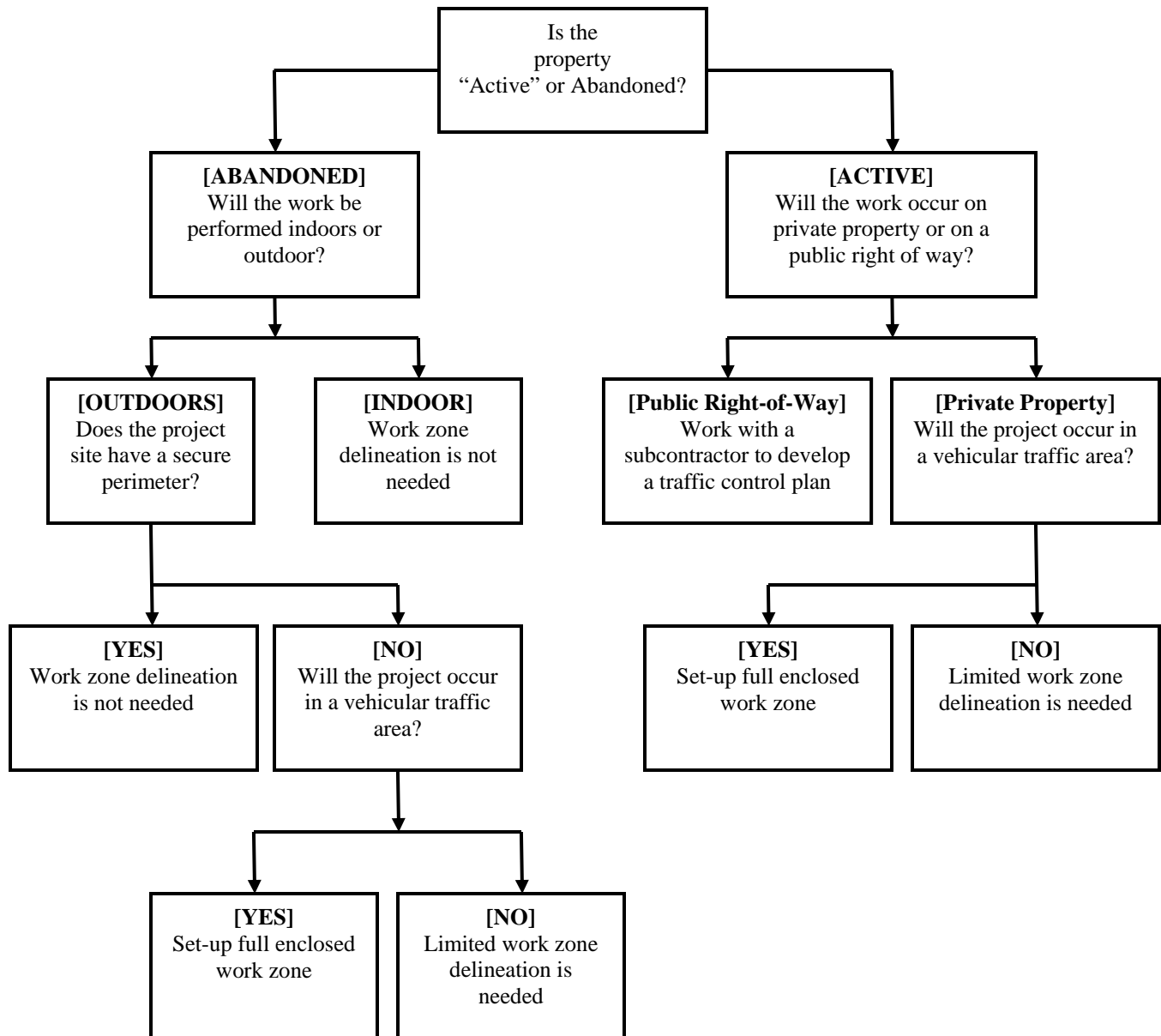
8.0 Appendices

36-01 – Work Zone Decision Tree (Guidance for development of the Work Zone).

9.0 References

9.1 - U.S. Department of Transportation (DOT) Federal Highway Administration, Part IV of the Manual on Uniform Traffic Control Devices -- Standards and Guides for Traffic Controls for Street and Highway Construction, Maintenance, Utility and Incident Management Operations.

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Appendix D

Applicable Material Safety Data Sheets (MSDS)

POLYCHLOROBIPHENYLS

5503

mixture: $C_{12}H_{10-x}Cl_x$
[where x = 1 to 10]

MW: ca. 258 (42% Cl ; $C_{12}H_7Cl_5$);
ca. 326 (54% Cl ; $C_{12}H_5Cl_7$)

CAS: Table 1

RTECS: Table 1

METHOD: 5503, Issue 2

EVALUATION: PARTIAL

Issue 1: 15 February 1984

Revision #1: 15 August 1987

Issue 2: 15 August 1994

OSHA : 1 mg/m³ (42% Cl);
0.5 mg/m³ (54% Cl)

NIOSH: 0.001 mg/m³/10 h (carcinogen)

ACGIH: 1 mg/m³ (42% Cl) (skin)
0.5 mg/m³ (54% Cl) (skin)

PROPERTIES: 42% Cl: BP 325 to 366 °C; MP -19 °C;
d 1.38 g/mL @ 25 °C;

VP 0.01 Pa (8 x 10⁻⁵ mm Hg;
1 mg/m³) @ 20 °C

54% Cl: BP 365 to 390 °C; MP 10 °C;
d 1.54 g/mL @ 25 °C; VP
0.0004 Pa (3 x 10⁻⁶ mm Hg;
0.05 mg/m³) @ 20 °C

SYNONYMS: PCB; 1,1'-biphenyl chloro; chlorodiphenyl, 42% Cl (Aroclor 1242); and 54% Cl (Aroclor 1254)

SAMPLING		MEASUREMENT	
SAMPLER:	FILTER + SOLID SORBENT (13-mm glass fiber + Florisil, 100 mg/50 mg)	TECHNIQUE:	GAS CHROMATOGRAPHY, ECD (⁶³ Ni)
FLOW RATE:	0.05 to 0.2 L/min or less	ANALYTE:	polychlorobiphenyls
VOL-MIN:	1 L @ 0.5 mg/m ³	DESORPTION:	filter + front section, 5 mL hexane; back section, 2 mL hexane
-MAX:	50 L	INJECTION VOLUME:	4-μL with 1-μL backflush
SHIPMENT:	transfer filters to glass vials after sampling	TEMPERATURE-INJECTION:	250 to 300 °C
SAMPLE STABILITY:	unknown for filters; 2 months for Florisil tubes [1]	-DETECTOR:	300 to 325 °C
BLANKS:	2 to 10 field blanks per set	-COLUMN:	180 °C
		CARRIER GAS:	N ₂ , 40 mL/min
		COLUMN:	glass, 1.8 m x 2-mm ID, 1.5% OV-17/1.95% QF-1 on 80/100 mesh Chromosorb WHP
		CALIBRATION:	standard PCB mixture in hexane
		RANGE:	0.4 to 4 μg per sample [2]
		ESTIMATED LOD:	0.03 μg per sample [2]
		PRECISION (S _p):	0.044 [1]
ACCURACY			
RANGE STUDIED:	not studied		
BIAS:	none identified		
OVERALL PRECISION (S _{PT}):	not evaluated		
ACCURACY:	not determined		

APPLICABILITY: The working range is 0.01 to 10 mg/m³ for a 40-L air sample [1]. With modifications, surface wipe samples may be analyzed [3,4].

INTERFERENCES: Chlorinated pesticides, such as DDT and DDE, may interfere with quantification of PCB. Sulfur-containing compounds in petroleum products also interfere [5].

OTHER METHODS: This method revises methods S120 [6] and P&CAM 244 [1]. Methods S121 [7] and P&CAM 253 [8] for PCB have not been revised.

REAGENTS:

1. Hexane, pesticide quality.
2. Florisil, 30/48 mesh sieved from 30/60 mesh. After sieving, dry at 105 °C for 45 min. Mix the cooled Florisil with 3% (w/w) distilled water.
3. Nitrogen, purified.
4. Stock standard solution of the PCB in methanol or isooctane (commercially available).*

* See SPECIAL PRECAUTIONS.

EQUIPMENT:

1. Sampler: 13-mm glass fiber filter without binders in a Swinnex cassette (Cat. No. SX 0001300, Millipore Corp.) followed by a glass tube, 7 cm long, 6-mm OD, 4-mm ID containing two sections of 30/48 mesh deactivated Florisil. The front section is preceded by glass wool and contains 100 mg and the backup section contains 50 mg; urethane foam between sections and behind the backup section. (SKC 226-39, Supelco ORBO-60, or equivalent) Join the cassette and Florisil tube with PVC tubing, 3/8" L x 9/32" OD x 5/32" ID, on the outlet of the cassette and with another piece of PVC tubing, 3/4" L x 5/16" OD x 3/16" ID, complete the union.
2. Personal sampling pump, 0.05 to 0.2 L/min, with flexible connecting tubing.
3. Tweezers.
4. Vials, glass, 4- and 7-mL, with aluminum or PTFE-lined caps
5. Gas chromatograph, electron capture detection (⁶³Ni), integrator and column (page 5503-1).
6. Volumetric flasks, 10-mL and other convenient sizes for preparing standards.
7. Syringe, 10-μL.

SPECIAL PRECAUTIONS: Avoid prolonged or repeated contact of skin with PCB and prolonged or repeated breathing of the vapor [9-11].

SAMPLING:

1. Calibrate each personal sampling pump with a representative sampler in line.
2. Break the ends of the Florisil tube immediately before sampling. Connect Florisil tube to Swinnex cassette and attach sampler to personal sampling pump with flexible tubing.
3. Sample at an accurately known flow rate between 0.05 and 0.2 L/min for a total sample size of 1 to 50 L.
NOTE: At low PCB concentrations, the sampler was found to be efficient when operated at flow rates up to 1 L/min, for 24 hours [4]. Under these conditions, the limit of detection was 0.02 μg/m³.
4. Transfer the glass fiber filters to 7-mL vials. Cap the Florisil tubes with plastic (not rubber) caps and pack securely for shipment.

SAMPLE PREPARATION:

5. Place the glass wool and 100-mg Florisil bed in the same 7-mL vial in which the filter was stored. Add 5.0 mL hexane.
6. In a 4-mL vial, place the 50-mg Florisil bed including the two urethane plugs. Add 2.0 mL hexane.
7. Allow to stand 20 min with occasional agitation.

CALIBRATION AND QUALITY CONTROL:

8. Calibrate daily with at least six working standards over the range 10 to 500 ng/mL PCB.
 - a. Add known amounts of stock standard solution to hexane in 10-mL volumetric flasks and dilute to the mark.
 - b. Analyze together with samples and blanks (steps 11 and 12).
 - c. Prepare calibration graph (sum of areas of selected peaks vs. ng PCB per sample).
9. Determine desorption efficiency (DE) at least once for each lot of glass fiber filters and Florisil used for sampling in the calibration range (step 8). Prepare three tubes at each of five levels plus three media blanks.
 - a. Remove and discard back sorbent section of a media blank Florisil tube.
 - b. Inject known amounts of stock standard solution directly onto front sorbent section and onto a media blank filter with a microliter syringe.
 - c. Cap the tube. Allow to stand overnight.
 - d. Desorb (steps 5 through 7) and analyze together with working standards (steps 11 and 12).
 - e. Prepare a graph of DE vs. µg PCB recovered.
10. Analyze three quality control blind spikes and three analyst spikes to ensure that the calibration graph and DE graph are in control.

MEASUREMENT:

11. Set gas chromatograph according to manufacturer's recommendations and to conditions given on page 5503-1. Inject sample aliquot manually using solvent flush technique or with autosampler.

NOTE 1: Where individual identification of PCB is needed, a procedure using a capillary column may be used [12].

NOTE 2: If peak area is above the linear range of the working standards, dilute with hexane, reanalyze and apply the appropriate dilution factor in calculations.
12. Sum the areas for five or more selected peaks.

CALCULATIONS:

13. Determine the mass, µg (corrected for DE) of PCB found on the glass fiber filter (W) and in the Florisil front (W_f) and back (W_b) sorbent sections, and in the average media blank filter (B) and front (B_f) and back (B_b) sorbent sections.

NOTE: If $W_b > W_f/10$, report breakthrough and possible sample loss.
14. Calculate concentration, C, of PCB in the air volume sampled, V (L):

$$C = \frac{(W + W_f + W_b - B - B_f - B_b)}{V}, \text{ mg/m}^3.$$

EVALUATION OF METHOD:

This method uses 13-mm glass fiber filters which have not been evaluated for collecting PCB. In Method S120, however, Aroclor 1242 was completely recovered from 37-mm glass fiber filters using 15 mL isooctane [8,13,14]. With 5 mL of hexane, Aroclor 1016 was also completely recovered from 100-mg Florisil beds after one-day storage [1]. Thus, with no adsorption effect likely on glass fiber filters for PCB, 5 mL hexane should be adequate to completely extract PCB from combined filters and front sorbent sections. Sample stability on glass fiber filters has not been investigated. Breakthrough volume was >48 L for the Florisil tube at 75% RH in an atmosphere containing 10 mg/m³ Aroclor 1016 [1].

REFERENCES:

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- [9] Criteria for a Recommended Standard . . . Occupational Exposure to Polychlorinated Biphenyls, U.S. Department of Health, Education, and Welfare, Publ. (NIOSH) 77-225 (1977).
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- [13] Backup Data Report for S120, prepared under NIOSH Contract 210-76-0123, available as "Ten NIOSH Analytical Methods, Set 2," Order No. Pb 271-464 from NTIS, Springfield, VA 22161.
- [14] NIOSH Research Report-Development and Validation of Methods for Sampling and Analysis of Workplace Toxic Substances, U.S. Department of Health and Human Services, Publ. (NIOSH) 80-133 (1980).
- [15] Hutzinger, O., S. Safe, and V. Zitko. The Chemistry of PCBs, CRC Press, Inc., Cleveland, OH (1974).

METHOD REVISED BY:

James E. Arnold, NIOSH/DPSE; S120 originally validated under NIOSH Contract 210-76-0123.

Table 1. General Information.

<u>Compound</u>	<u>CAS</u>	<u>RTECS</u>
Polychlorinated Biphenyls	1336-36-3	TQ1350000
Chlorobiphenyl	27323-18-8	DV2063000
Aroclor 1016 (41% Cl)	12674-11-2	TQ1351000
Aroclor 1242 (42% Cl)	53469-21-9	TQ1356000
Aroclor 1254 (54% Cl)	11097-69-1	TQ1360000

Table 2. Composition of some Aroclors [15].

<u>Major Components</u>	<u>Aroclor 1016</u>	<u>Aroclor 1242</u>	<u>Aroclor 1254</u>
Biphenyl	0.1%	<0.1%	<0.1%
Monochlorobiphenyls	1	1	<0.1
Dichlorobiphenyls	20	16	0.5
Trichlorobiphenyls	57	49	1
Tetrachlorobiphenyls	21	25	21
Pentachlorobiphenyls	1	8	48
Hexachlorobiphenyls	<0.1	1	23
Heptachlorobiphenyls	none detected	<0.1	6
Octachlorobiphenyls	none detected	none detected	none detected

**MSDS** MATERIAL SAFETY DATA SHEET

HI-VALLEY CHEMICAL INC. \ LAB SUPPLY
• 1134 WEST 850 NORTH CENTERVILLE, UTAH 84014 •
(801) 295-9591 • www.hvchemical.com

HEXANE

1. === Product Identification ===**Synonyms:** Hexanes, Normal Hexane; Hexyl Hydride; Hexane 95%**CAS No.:** 110-54-3 (n-hexane)**Molecular Weight:** 86.18**Chemical Formula:** CH₃(CH₂)₄CH₃ n-hexane**2. === Composition/Information on Ingredients ===**

Ingredient	CAS No	Percent	Hazardous
Hexane	110-54-3	85 - 100%	Yes
Methylcyclopentane	96-37-7	1 - 2%	Yes
Trace amount of Benzene (10 ppm	071-43-2	*	No

3. === Hazards Identification ===**Emergency Overview**

DANGER! EXTREMELY FLAMMABLE LIQUID AND VAPOR. VAPOR MAY CAUSE FLASH FIRE. HARMFUL OR FATAL IF SWALLOWED. HARMFUL IF INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. AFFECTS THE CENTRAL AND PERIPHERAL NERVOUS SYSTEMS.

Health Rating: 2 - Moderate

Flammability Rating: 3 - Severe (Flammable)

Reactivity Rating: 0 - None

Contact Rating: 2 - Moderate

Lab Protective Equip: GOGGLES; LAB COAT; VENT HOOD; PROPER GLOVES; CLASS B EXTINGUISHER

Storage Color Code: Red (Flammable)

Potential Health Effects

The health hazards addressed are for the major component: n-hexane.

Inhalation:

Inhalation of vapors irritates the respiratory tract. Overexposure may cause lightheadedness, nausea, headache, and blurred vision. Greater exposure may cause muscle weakness, numbness of the extremities, unconsciousness and death.

Ingestion:

May produce abdominal pain, nausea. Aspiration into lungs can produce severe lung damage and is a medical emergency. Other symptoms expected to parallel inhalation.

Skin Contact:

May cause redness, irritation, with dryness, cracking.

Eye Contact:

Vapors may cause irritation. Splashes may cause redness and pain.

Chronic Exposure:

Repeated or prolonged skin contact may defat the skin and produce irritation and dermatitis. Chronic inhalation may cause peripheral nerve disorders and central nervous system effects.

Aggravation of Pre-existing Conditions:

Persons with pre-existing skin disorders or eye problems or impaired respiratory function may be more susceptible to the effects of the substance. May affect the developing fetus.

4. === First Aid Measures ===**Inhalation:**

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

Ingestion:

Aspiration hazard. If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. Get medical attention immediately.

Skin Contact:

Remove any contaminated clothing. Wipe off excess from skin. Wash skin with soap and water for at least 15 minutes. Get medical attention if irritation develops or persists.

Eye Contact:

Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

Note to Physician:

BEI=2,5-hexadione in urine, sample at end of shift at workweeks end, 5 mg/g creatine. Also, measure n-hexane in expired air. Analgesics may be necessary for pain management, there is no specific antidote. Monitor arterial blood gases in cases of severe aspiration.

5. Fire Fighting Measures**Fire:**

Flash point: -23C (-9F) CC

Autoignition temperature: 224C (435F)

Flammable limits in air % by volume:

lcl: 1.2; ucl: 7.7

Extremely Flammable Liquid and Vapor! Vapor may cause flash fire. Dangerous fire hazard when exposed to heat or flame.

Explosion:

Above flash point, vapor-air mixtures are explosive within flammable limits noted above. Contact with oxidizing materials may cause extremely violent combustion. Explodes when mixed @ 28C with dinitrogen tetroxide. Sensitive to static discharge.

Fire Extinguishing Media:

Dry chemical, foam or carbon dioxide. Water may be ineffective.

Special Information:

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. Water spray may be used to keep fire exposed containers cool. Vapors can flow along surfaces to distant ignition source and flash back. Vapor explosion hazard exists indoors, outdoors, or in sewers.

6. Accidental Release Measures

Ventilate area of leak or spill. Remove all sources of ignition. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Use non-sparking tools and equipment. Collect liquid in an appropriate container or absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! If a leak or spill has not ignited, use water spray to disperse the vapors, to protect personnel attempting to stop leak, and to flush spills away from exposures. US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802

7. Handling and Storage

Protect against physical damage. Store in a cool, dry well-ventilated location, away from direct sunlight and any area where the fire hazard may be acute. Store in tightly closed containers (preferably under nitrogen atmosphere). Outside or detached storage is preferred. Inside storage should be in a standard flammable liquids storage room or cabinet. Separate from oxidizing materials. Containers should be bonded and grounded for transfers to avoid static sparks. Storage and use areas should be No Smoking areas. Use non-sparking type tools and equipment. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

8. Exposure Controls /Personal Protection**Airborne Exposure Limits:**

N-Hexane [110-54-3]:

-OSHA Permissible Exposure Limit (PEL): 500 ppm (TWA)

-ACGIH Threshold Limit Value (TLV): 50 ppm (TWA), Skin

other isomers of hexane

-ACGIH Threshold Limit Value (TLV): 500 ppm (TWA), 1000 ppm (STEL)

Ventilation System:

A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved):

If the exposure limit is exceeded and engineering controls are not feasible, wear a supplied air, full-facepiece respirator, airlined hood, or full-facepiece self-contained breathing apparatus. Breathing air quality must meet the requirements of the OSHA respiratory protection standard (29CFR1910.134).

Skin Protection:

Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

Eye Protection:

Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical/Chemical Properties**Appearance:**

Clear, colorless liquid.

Odor:

Light odor.

Solubility:

Insoluble in water.

Specific Gravity:

0.66

pH:

No information found.

% Volatiles by volume @ 21C (70F):

100

Boiling Point:

ca. 68C (ca. 154F)

Melting Point:

ca. -95C (ca. -139F)

Vapor Density (Air=1):

3.0

Vapor Pressure (mm Hg):

130 @ 20C (68F)

Evaporation Rate (BuAc=1):

9

10. === Stability and Reactivity Data ===**Stability:**

Stable under ordinary conditions of use and storage. Heat will contribute to instability.

Hazardous Decomposition Products:

May produce acrid smoke and irritating fumes when heated to decomposition.

Hazardous Polymerization:

Will not occur.

Incompatibilities:

Strong oxidizers.

Conditions to Avoid:

Heat, flames, ignition sources and incompatibles.

11. === Toxicological Information ===

N-Hexane: Oral rat LD50: 28710 mg/kg. Irritation eye rabbit: 10 mg mild. Investigated as a tumorigen, mutagen and reproductive effector.

-----\Cancer Lists\-----			
Ingredient	---NTP Carcinogen---		IARC Category
	Known	Anticipated	
Hexane (110-54-3)	No	No	None
Methylcyclopentane (96-37-7)	No	No	None
Trace amount of Benzene (10 ppm) (071-43-2)	Yes	No	1

12. === Ecological Information ===**Environmental Fate:**

When released into the soil, this material may biodegrade to a moderate extent. When released into the soil, this material is not expected to leach into groundwater. When released into the soil, this material is expected to quickly evaporate. When released into water, this material may biodegrade to a moderate extent. When released to water, this material is expected to quickly evaporate. When released into the water, this material is expected to have a half-life between 1 and 10 days. This material has an estimated bioconcentration factor (BCF) of less than 100. This material has a log octanol-water partition coefficient of greater than 3.0. This material is not expected to significantly bioaccumulate. When released into the air, this material is expected to be readily degraded by reaction with photochemically produced hydroxyl radicals. When released into the air, this material is expected to have a half-life between 1 and 10 days.

Environmental Toxicity:

No information found.

13. === Disposal Considerations ===

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved incinerator or disposed in a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. === MSDS Transport Information ===**Domestic (Land, D.O.T.)****Proper Shipping Name:** HEXANES**Hazard Class:** 3

UN/NA: UN1208

Packing Group: II

Information reported for product/size: 215L

International (Water, I.M.O.)**Proper Shipping Name:** HEXANES**Hazard Class:** 3

UN/NA: UN1208

Packing Group: II

Information reported for product/size: 215L

15. === Regulatory Information ===

-----\Chemical Inventory Status - Part 1\-----				
Ingredient	TSCA	EC	Japan	Australia
Hexane (110-54-3)	Yes	Yes	Yes	Yes
Methylcyclopentane (96-37-7)	Yes	Yes	No	Yes
Trace amount of Benzene (10 ppm) (071-43-2)	Yes	Yes	Yes	Yes

-----\Chemical Inventory Status - Part 2\-----				
Ingredient	Korea	DSL	Canada--NDSL	Phil.
Hexane (110-54-3)	Yes	Yes	No	Yes
Methylcyclopentane (96-37-7)	Yes	Yes	No	Yes
Trace amount of Benzene (10 ppm) (071-43-2)	Yes	Yes	No	Yes

-----\Federal, State & International Regulations - Part 1\-----				
Ingredient	-SARA 302- RQ	TPQ	-SARA 313- List	Chemical Catg.
Hexane (110-54-3)	No	No	Yes	No
Methylcyclopentane (96-37-7)	No	No	No	No
Trace amount of Benzene (10 ppm) (071-43-2)	No	No	Yes	No

-----\Federal, State & International Regulations - Part 2\-----				
Ingredient	CERCLA	-RCRA- 261.33	-TSCA- 8(d)	
Hexane (110-54-3)	5000	No	No	
Methylcyclopentane (96-37-7)	No	No	No	
Trace amount of Benzene (10 ppm) (071-43-2)	10	U019	No	

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
 SARA 311/312: Acute: Yes Chronic: Yes Fire: Yes Pressure: No
 Reactivity: No (Mixture / Liquid)

WARNING:

THIS PRODUCT CONTAINS A CHEMICAL(S) KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER.

Australian Hazchem Code: 3[Y]E

Poison Schedule: None allocated.

WHMIS:

This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. === Other Information ===

NFPA Ratings: Health: 1 Flammability: 3 Reactivity: 0

Label Hazard Warning:

DANGER! EXTREMELY FLAMMABLE LIQUID AND VAPOR. VAPOR MAY CAUSE FLASH FIRE. HARMFUL OR FATAL IF SWALLOWED. HARMFUL IF INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. AFFECTS THE CENTRAL AND PERIPHERAL NERVOUS SYSTEMS.

Label Precautions:

Keep away from heat, sparks and flame.
 Keep container closed.
 Use only with adequate ventilation.
 Wash thoroughly after handling.
 Avoid breathing vapor or mist.
 Avoid contact with eyes, skin and clothing.

Label First Aid:

Aspiration hazard. If swallowed, vomiting may occur spontaneously, but DO NOT INDUCE. If vomiting occurs, keep head below hips to prevent aspiration into lungs. Never give anything by mouth to an unconscious person. Call a physician immediately. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. In all cases call a physician.

Product Use:

Laboratory Reagent.

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Revision Date 1/2007

Appendix E

ATC Employee Training Records

Appendix F

ATC Safety Policy Number 51 - Incident Reporting and Investigation

	Employee Health & Safety Policy Manual	Policy Section #:	51
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	Subject: Incident Reporting & Investigation	Revision:	02
		Issue Date:	04-03-2008

1.0 Policy

Incidents arising out of ATC Associates (ATC) operations shall be properly reported, investigated, documented, communicated, and managed.

2.0 Purpose

ATC's goal is to operate in a manner that results in "ZERO" injuries, illnesses, exposures, and property/equipment damage. When an incident does occur, we intend to learn from it such that the same incident is not repeated again.

The purpose of this Policy is to establish procedures to ensure all incidents are properly reported, documented, investigated, communicated, and managed. In the case of regulatory agencies and insurance carriers, proper and timely communications and documentation of incidents is critical.

3.0 Scope


This Policy applies to all incidents occurring in the course of and/or arising from work activities conducted at, or while traveling to, project sites managed by ATC and at all Branch locations. **This Policy covers minimum performance standards applicable to all ATC Associates employees and locations. Local practices requiring more detailed or stringent rules, or local, State or Federal requirements regarding this subject can and should be added as an addendum to this procedure as applicable.**

4.0 Definitions

Contributing Factor – means a readily observed or simple, apparent reason for the occurrence of an Incident. A Contributing Factor helps explain "What" happened but not "Why". Contributing Factors may be assigned to four broad categories: (1) Employees/People; (2) Management Systems and Processes; (3) Equipment, Tools, or Materials; and (4) Environment.

Employer's First Report of Injury – means an insurance term for a form commonly used to document cases for workers' compensation claims.

First-Aid Case - means an occupational injury or illness where the care received is minor in nature and is not classified as "Medical Treatment" according to OSHA record keeping guidelines. First-aid is generally a one-time treatment of minor injuries or exposures that does not meet medical treatment standards, even if provided by professional nurses or physicians. OSHA defines First-Aid as items in a distinct listing of minor treatments. Refer to Policy 52, OSHA Reporting & Recordkeeping.

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Health Insurance Portability and Accountability Act (HIPAA) - means an Act of Congress that resulted in Federal protections for the privacy of personal health information.

High Profile Event – means an event that triggers reporting requirements to a Federal Agency and/or an event that requires a coordinated ATC response:

- Employee fatality;
- Injuries to three (3) or more employees from the same event;
- Employee hospitalization for any reason;
- Employee rescue provided by public services;
- Likelihood of a serious business interruption;
- Injury, exposure, property damage or similar event involving the general public that is likely to result in coverage by the News Media;
- Incidents involving Commercial Motor Vehicles or drivers with Commercial Driver's Licenses (DOT events);
- Environmental releases or spills; and
- Other similar events.


Incident - means any event that occurs during the performance of work activities (including Hazard Recognition events such as Unsafe Acts or Unsafe Conditions, and "Near-Miss" events) that could have or did result in injury, illness, employee exposure, property damage or theft, hazardous materials release, alleged regulatory non-compliance, or "High Profile" Events.

Incident Investigation – means the process of investigating, evaluating and analyzing an incident to determine Contributing Factors and objectively establishing "Root Causes" of the event so that appropriate actions can be taken to minimize the possibility of similar events in the future. Refer to Appendix 51-02 (Incident Investigation Process).

Incident Report – means a standardized form used to record the facts, Contributing Factors, Root Causes and Corrective Actions associated with an incident. The form used by ATC is the Supervisor's Investigation Report (SIR) form (See Appendix 51-01).

Near Miss - means an incident in which an injury, illness, exposure, hazardous material release, or property damage did not occur, but could have occurred if there had been a slight difference in timing, position, or force.

OSHA – means the Occupational Safety and Health Administration, a Federal Agency under the Department of Labor. OSHA sets the regulations related to occupational injury or illness reporting and recordkeeping.

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Property Damage - means the property of ATC Associates or others (including vehicles), is damaged to such a degree that repair, replacement, or restitution may be necessary.

Return-to-Work (RTW) Program – means the process for actively managing the return of an employee to a productive role following a work-related injury, illness, or exposure. ATC is committed to making the necessary accommodations to ensure a quick RTW for all employees.

Root Cause – means the fundamental, underlying reason(s) for the occurrence of an Incident, which if eliminated, would prevent recurrence. The source or origin of an event. A Root Cause explains “why” an Incident (or Contributing Factor) occurred. A Root Cause is not always readily apparent or easily observed, and is determined only through the use of a “drill down” investigative process.

Unsafe Act – means a behavior that, under the right circumstances, could result in a Near Miss or more serious incident.

Unsafe Condition – means a physical condition that, under the right circumstances, could result in a Near Miss or more serious incident.

5.0 Requirements


Report all incidents as defined in Section 4.0.

NOTE: Some Clients may have very specific incident reporting procedures. In these cases, you must still adhere to ATC requirements **AND** meet the Client requirements as well.

There are various types of Incidents (injury, illness, property damage, theft, etc.) but the basic response should be the same:

- **React** – to minimize the severity of the Incident (e.g., stop work, provide aid, and immediately contact your Supervisor for help in managing the Incident).
- **Investigate** – to determine what happened, Contributing Factors, Root Causes, and Corrective Actions (use the Incident Investigation Process).
- **Report** – by completing and distributing the Supervisors' Investigation Report (SIR).
- **Learn** – from past Incidents; implement corrective actions.

ATC expects the Supervisor to play the lead role in managing, investigating, and reporting each Incident.

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Use the Supervisor's Investigation Report (SIR - Appendix 51-01) for reporting. If the Root Cause is not readily apparent, you can use the Incident Investigation Process (Appendix 51-02) and Incident Investigation Process Work Sheet (51-03a) as a guide. Investigate and report without delay. Response time is as follows:

- **Incidents** - The SIR must be completed by a Supervisor and emailed within eight (8) business hours (24 calendar hours). The SIRs are distributed to established Regional incident distribution lists:
 - NorthSIR@atcassociates.com;
 - SouthSIR@atcassociates.com; or
 - WestSIR@atcassociates.com.
- **High Profile Events** - Must be reported by telephone to the Risk Management Department as soon as practical (within minutes if possible) after the Event. Email or fax is not acceptable for High Profile Events. Follow-up the telephone report with the SIR.

The Supervisor should contact the Risk Management Department for guidance if there is a chance that the SIR will not be submitted on time. Depending on the circumstances, you may be asked to submit the partially completed report and supplement with additional information later, or may be given an extension of the deadline such that a complete investigation and SIR can be generated, or if the Supervisor wants feedback on any aspect of the incident investigation and evaluation before committing findings to the SIR.


5.1 Employee Injuries/Illnesses

5.1.1 Initial Reporting, First-Aid or Medical Assistance

Employees have a responsibility to immediately notify their direct Supervisor of any Incident that occurs, regardless of severity, including Near-Miss events.

For life-threatening emergencies, employees must immediately contact 911 or other emergency responder, and notify their Supervisor as soon as practical afterwards.

For injuries/illnesses that are not life threatening, the employee and/or Supervisor must immediately contact ATC's toll-free injury assessment hotline (COMP-CARE). The number is provided on posting at individual Branches, on the ATC H&S web site, and also on the ATC Lifelines cards.

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By calling COMP-CARE, we facilitate an appropriate response for the employee, including specific recommendations for assisting in first-aid response and/or referral for additional care and treatment. Depending upon the individual case, COMP-CARE will refer the employee to an in-network occupational clinic for additional treatment and care. COMP-CARE is a service for ATC that manages the injury, care provided, and treatments throughout the process. COMP-CARE is staffed with Registered Professional Nurses 24-7, 365 days per year.) For more serious injuries, call 911.

NOTE: Before providing first-aid care for an injured employee (or others), you must ensure that you use “Universal Precautions” to protect against Bloodborne Pathogens (refer to Policy No. 09). You should always use the appropriate PPE to assist in protection. As with other incidents, COMP-CARE must be notified promptly for all non-life-threatening injuries. For more serious injuries, call 911.

PRIVACY NOTE: The Health Insurance Portability and Accountability Act [HIPAA] authorizes ATC to gather and manage medical information in connection with work related injuries and illnesses. This is necessary so ATC can comply with safety and workers’ compensation regulations. If an employee is absent from work or seeks medical treatment for an injury or illness, and it is not known if the reason is work related or personal, it is appropriate for you to ask a few questions to determine if the matter is work related. Refer to HIPAA guidance at the ATC Health & Safety website for further details about how to ask these questions.

For work-related injury and vehicle incident cases, COMP-CARE will instruct the local clinic to conduct “Post-Incident” drug & alcohol screening, as required by, and according to, the ATC Drug and Alcohol Policy.

All cases resulting in medical treatment beyond first-aid (such as treatment provided by paramedic, clinic or hospital) must be reported to ATC’s workers’ compensation insurer. This requires that the Branch Workers’ Compensation representative call the insurer’s toll-free claim reporting service, and may also require completion of a State-specific Employer’s First Report of Injury form. The Claims Reporting Guidance document is provided to each Branch Administrator and is posted at the ATC H&S website.

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There is also a requirement to complete an OSHA 301 form. However, ATC's SIR form, when properly completed, captures all elements of the 301 such that you do not need that additional form.

In the case of fatality/multiple hospitalization (High Profile) events, notification must be made to the OSHA Agency with jurisdiction within eight (8) hours. That notification is made by the Risk Management Department after conferring with the applicable Branch Manager.


MONOPOLISTIC STATE NOTES: Washington State - the First Report is filled out by the physician/hospital/clinic and forwarded to the Work Comp Bureau of Washington. Ohio - will fax their reports to the specific number provided for their state.

5.1.2 Return-to-Work (RTW) Program

ATC has an active Return-to-Work Program to ensure that employees are returned to a productive role as soon as reasonably possible following any occupational injury or illness. As previously noted, all injuries or illnesses must be promptly reported to the employee's Supervisor, regardless of how minor they may initially appear. In addition, COMP-CARE must be notified immediately. COMP-CARE assists in the management of the case through the employee's ultimate return to work.

ATC will make the necessary accommodations to bring an employee back to work in a productive role. This includes provisions for limited terms of modified duty ("light-duty" work) during the recovery or rehabilitation period. COMP-CARE is aware of ATC's RTW Program and will work actively with health care providers following an occupational injury or illness to ensure that they are aware of ATC's RTW Program.

Work accommodations may be necessary when an employee has an occupational injury or illness and it has been determined by the treating physician that the employee cannot perform the full duties of their job assignment. It should be noted that this requires some knowledge of the ATC job functions. Where an employee is treated by a physician other than an occupational physician, or the designated occupational physician for ATC Associates, additional evaluation is required by ATC's designated occupational physician at the local clinic. This means that the employee shall be evaluated by the occupational physician at the ATC local clinic prior to their return to work.

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Because of this active RTW Program, any Supervisor who does not believe an employee can be returned to work (and will thus lose one or more workdays), must have written authorization from the Senior Regional Vice President for their Region.

It is the belief of ATC Management that an employee returned to work, even if in a modified work role, benefits both the employee as well as ATC. Management will adhere to the modifications as established by the occupational physician to ensure that work activities do not jeopardize in any way the recovery of the employee to full duty status.

5.1.3 Follow-up Reporting Requirements & OSHA Recordkeeping


When medical attention is required, instruct the injured employee to provide his/her Supervisor a report from the doctor indicating both the diagnosis and treatment received, as well as any recommendations for follow-up treatment and any work restrictions. A copy of this information must be forwarded to the Risk Management Department.

The Branch Workers' Compensation representative or Supervisor must keep an accurate log of "lost" and "restricted" workdays for each employee with a work-related injury/illness. This information must be provided to the Risk Management Department until the employee is no longer experiencing lost days or restricted duty. If lost/restricted days are discontinued but then must start up again due to a relapse, surgery or for other reasons, the reporting of days lost or restricted must start up again.

Some states including Texas and California require additional information to be provided to employees following a work-related injury or illness including a copy of the First Report of Injury, completion of an employee injury/illness report and/or information on the employee's rights and responsibilities. If unsure, check with your State Agency or contact the Risk Management Department.

Send all invoices related to any work-related injury and/or illness, as well as original physician's notes to the appropriate Workers' Compensation Insurance Carrier. If unsure, contact the Risk Management Department

The Risk Management Department evaluates individual incidents, determines OSHA Recordability and reports High Profile Events to OSHA as described previously. This is done based on the documentation and discussions with personnel at the Branch where the incident occurred. Refer to Policy Section 52 – OSHA Recordkeeping – for further details.

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The Risk Management Department maintains centralized OSHA 300 Logs and 300A Summary Forms for each individual Branch. Maintaining the Logs requires accurate details of days lost and/or days of restricted activity due to occupational injury, illness, or exposures.

5.2 Vehicle Incidents

5.2.1 First-aid or Medical Assistance

As with any other occupational injury, the first priority when an employee is injured in a vehicle incident is to assess their physical condition and provide first-aid or medical assistance as needed. Arrange for medical assistance for others (non-employees) as necessary. Before providing first-aid care, you must ensure that you use “Universal Precautions” to protect against Bloodborne Pathogens. You should always use the appropriate PPE to assist in protection.

As with other incidents, COMP-CARE must be immediately notified for all non-life-threatening injuries (refer to section 5.1). For more serious injuries, call 911.


5.2.2 Notifications

It is the employee's responsibility to notify the Police, their Supervisor, and COMP-CARE as soon as possible regarding any on-the-job vehicle incident.

When ATC vehicles are involved in an incident, you must promptly notify GE Fleet Management Services. The number is provided on the ATC Lifelines cards.

If the incident involves an injury, the employee and Supervisor must follow the procedures described in section 5.1.1. Even if there is no ATC employee injury the Supervisor must still investigate and complete the SIR as applicable to the vehicle incident.

If the incident involves an ATC owned, rented or leased vehicle and has resulted in bodily injury or damage to the property of someone other than ATC, the Branch must report the incident to ATC's auto insurance carrier within 24 hours (use the carrier's toll-free claim reporting line). If the incident results in damage that is limited to ATC's owned, rented or leased vehicle (i.e., no one other than ATC is affected) or involves damage that is caused by something other than a collision (e.g., theft, tree limb falling on vehicle,

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broken glass, fire), contact the Risk Management department for insurance reporting instructions.

In the event of an incident involving a DOT regulated vehicle (i.e., Commercial Motor Vehicle), comply with the notification requirements and follow the requirements as outlined in Policy 30 - Vehicle Safety.

For work-related vehicle incident cases, COMP-CARE will instruct the local clinic to conduct “Post-Incident” drug & alcohol screening, as required by, and according to, the ATC Drug and Alcohol Policy.

5.3 Property Damage Incidents (General Liability)

In the event of a property damage incident (e.g. drilling into utilities, damaging sidewalks, etc.), do the following:


- On site personnel should take action to minimize the severity of the loss, if this can be done safely. Do not admit responsibility or liability to anyone, but do indicate ATC’s interest in seeing the matter resolved as quickly as possible.
- The Supervisor must promptly contact the Risk Management Department by phone with an initial report, then investigate and distribute the SIR.
- Provide the Risk Management Department with a copy of ATC’s contract with the Client and any Subcontractors that are involved in the incident.

You will receive instructions for reporting the claim to the insurance carrier, or the claim will be reported to the carrier on your behalf, depending on circumstances.

NOTE: In some cases, Client requirements may include “Post-Incident” drug/alcohol screening following incidents related to Client work activities, including driving to and from the project site.

6.0 Appendices

1. 51-01 - Supervisor’s Investigation Report (SIR) Form.
2. 51-02 - Incident Investigation Process.
3. 51-03(a) - Incident Investigation Process Worksheet.
4. 51-03(b) – Incident Investigation (Example Case Overview).
5. 51-03(c) - Incident Investigation (Example Case).
6. 51-04 – COMP-CARE Posting.
7. 51-05 – Incident Reporting Process (Flow Chart).

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7.0 References

- Occupational Safety and Health Administration (OSHA), Recording and Reporting Occupational Injuries and Illnesses, 29CFR1904.
- ATC Drug and Alcohol Policy, Human Resources Department.



Appendix 51-01
Supervisor's Investigation Report (SIR)

SELECT INCIDENT CATEGORY (Drop-Down Menu)

Incident Category

SELECT FROM THIS LIST

☐ Other (List): _____

For Auto Incidents – Complete Motor Vehicle Addendum (next page)

For property damage or theft, estimated dollar amount: \$_____

INCIDENT & PROJECT SUMMARY

Date of Incident: _____ Time of Incident: _____ ☐ am ☐ pm Date of Reporting: _____ Time Reported _____ ☐ am ☐ pm

Incident Location (City): _____ State: _____ Subcontractor Name: _____ Equipment Involved: _____

Brief Description of Incident: _____ Task Being Performed: _____

Branch No. _____ Branch Name (City): _____ State: _____ Region: Select From List Regional Sr.VP: _____

Client Name: _____ Project Location (City): _____ Client Project Site No. _____

Project Client Contact: _____ ATC Project Manager: _____ Site Address: _____

Project (Site) Type: ☐ Petro (Retail) ☐ Petro (Upstream) ☐ Petro (Downstream) ☐ COP-RM&R ☐ COP-Other

☐ RELLC ☐ Shell ☐ Lab ☐ CMT ☐ Other (describe)_____

EMPLOYEE & CASE INFORMATION

Employee Name: _____ Emp. No. _____ NAICS Code: SELECT FROM THIS LIST Subcontractor Name: _____

Employee Status: ☐ Reg. Full-Time ☐ Part-Time ☐ Contractor ☐ Flex Claimant Name: _____

Title: _____ Supervisor: _____ Telephone No. _____

What was employee doing just before incident occurred?: _____

Body part(s) involved? _____ What was the injury of illness (how was body part affected)? _____

SELECT INCIDENT TYPE (Drop-Down Menu)

SELECT FROM THIS LIST

PHYSICIAN & MEDICAL FACILITY INFORMATION

Was employee treated in Emergency Room? ☐ Yes ☐ No Was COMP-CARE called? ☐ Yes ☐ No

First-Aid? ☐ Yes ☐ No Medical Treatment? ☐ Yes ☐ No Medical Facility Name: _____

Employee referred to ER/Clinic? ☐ Yes ☐ No Medical Facility Address: _____

Post-Incident Drug Test Needed? ☐ Yes ☐ No Completed? ☐ Yes ☐ No

Was employee hospitalized overnight as an in-patient? ☐ Yes ☐ No Did employee die? If Yes, Date of Death: _____

First-Aid or Medical Treatment Provided (Details): _____

Has Workers Compensation carrier been notified?: ☐ Yes ☐ No

INCIDENT & INVESTIGATION DETAILS

Conditions: Weather: SELECT FROM THIS LIST Lighting: SELECT FROM THIS LIST

Witness(es): ☐ Employee Name _____ Phone: _____ ☐ Contractor Name _____ Phone: _____

What object/substance directly harmed employee?: _____

Details of Incident (Who, What, When, Where & How): _____

Was Appendix 51-02 and/or 51-03(a) Used In This Investigation? ☐ Yes ☐ No By Whom? _____

What Contributing Factors and Root Causes led to this incident? _____

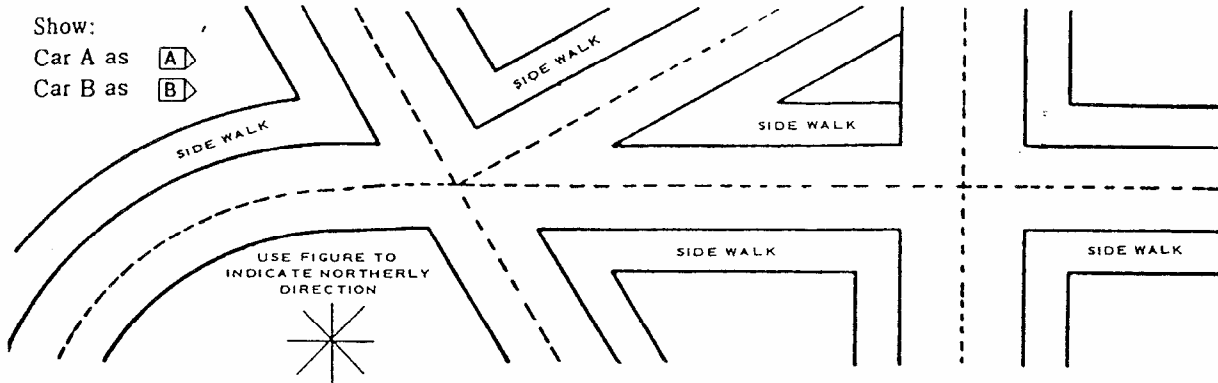
Corrective Actions - _____ -Assigned To- _____ -Date Due: _____

Environmental Releases: Product/Material Released: _____ Amount Released _____ Amount Recovered _____

Completed By: _____ Title: _____ Phone: _____ Date: _____

Motor Vehicle Incident Addendum

Incident Scene Diagram



If the police report contains a diagram you may omit this diagram. Otherwise, please use this diagram and PDF as a separate document

Description of Incident

Location of Incident: _____ Has GE Fleet Management been notified ☐ Yes ☐ No
Traffic Conditions: ☐ Heavy ☐ Moderate ☐ Light Posted Speed: _____ Road Conditions: _____
Construction Zone Involved? ☐ Yes ☐ No Weather Conditions: _____
Detailed Description of Incident (If Not Covered on Front Side): _____

Our Driver & Vehicle

Authorized Driver?: ☐ Yes ☐ No Company Vehicle Involved?: ☐ Yes ☐ No Current Vehicle Mileage?: _____
Unit No. _____ License Plate No. _____ ST _____
Vehicle Description (Year, Make, Model): _____ Gross Vehicle Weight (GVW): _____ Was vehicle involved a Commercial Motor Vehicle** (CMV)? ☐ Yes ☐ No Vehicle Towed From Scene? ☐ Yes ☐ No
Driver Using Seat Belts?: ☐ Yes ☐ No Driver Distracted?: ☐ Yes ☐ No Cell Phone in Use?: ☐ Yes ☐ No
Hauling Hazardous Materials? ☐ Yes ☐ No Materials Involved: _____ Materials Released? ☐ Yes ☐ No
Does employee have a Commercial Drivers License (CDL)? ☐ Yes ☐ No Employee Experience Driving (Years): _____
Post-Incident Drug Test Needed? ☐ Yes ☐ No Completed? ☐ Yes ☐ No
Damage Description (Our Vehicle): _____

Other Party Involved

Name of Other Party Involved: _____ Telephone: _____ Insurance Carrier: _____ Carrier Phone: _____
Other Party Vehicle(s) (Describe Year, Make, Model, Details): _____ Lic. Plate No. _____ ST: _____
Driver Using Seat Belts?: ☐ Yes ☐ No Driver Distracted?: ☐ Yes ☐ No Cell Phone in Use?: ☐ Yes ☐ No
Damage Description (Other Party Vehicle): _____

Injuries Involved

Any Fatalities? ☐ Yes ☐ No Any Injuries (Our Employees)? ☐ Yes ☐ No Any Injuries (Other Parties)? ☐ Yes ☐ No
Treatment Provided (Our Employee): ☐ First-aid ☐ Medical Treatment
Treatment Provided (Other Parties): ☐ First-aid ☐ Medical Treatment

Police Involvement

Were Police Notified? ☐ Yes ☐ No Did Local Police or Sheriff Investigate? ☐ Yes ☐ No
Name of authority investigating: _____
Were Citations Issued? ☐ Yes ☐ No Issued to: ☐ Our Employee ☐ Other Party
Describe Citation: _____
Police Report Secured: ☐ Yes ☐ No (Attach or submit when secured)

Witnesses

Name: _____ Address: _____ Telephone: _____
Name: _____ Address: _____ Telephone: _____
Name: _____ Address: _____ Telephone: _____

**A Commercial Motor Vehicle (CMV) is defined as any self-propelled or towed vehicle used on a highway in interstate commerce that has a Gross Vehicle Weight Rating (GVWR) or Gross Combination Weight Rating (GCWR – for towed vehicles) of 10,001 pounds or more. All motor vehicles sold in the U.S. have a weight rating listed on the driver-side door or door jamb. Trailers are rated separately and evaluated in combination with self-propelled vehicles.

Appendix 51-02
Incident Investigation Process

Incident Date: _____ Incident Type: _____ Client: _____
Brief Description of Incident: _____

The following process is to be used in conjunction with, or to support the completion of, the Supervisor's Investigation Report (SIR). This process is designed to provide a tool for use in identifying "Contributing Factors", developing conclusions, and then identifying the "Root Causes" of the event. Following this, you can establish an effective "Action Plan" for preventing future similar events.

Step No. 1: Consider Preliminary "Contributing Factors"

For each of the four categories identified: (1) Employees/Other People; (2) Management & Methods; (3) Equipment, Tools, or Materials; and (4) Environment, consider each statement for the incident being evaluated. Check each one that MAY be a direct or indirect "Preliminary" Contributing Factor. Initially, identify them without arguing over the merits of each. Once all Preliminary Contributing Factors have been selected, the evaluating person or team should go over each of them to ensure consensus. Once a Preliminary Contributing Factor has been identified as directly applicable to this event, it should then become a "Final" Contributing Factor that is then transferred to the next section of the process.

(1) Employees/Other People

- ☐ Not physically & mentally capable of performing the activity.
- ☐ Impaired as result of medications, alcohol, or illegal drugs.
- ☐ Not aware of procedures, or posted signs or signals.
- ☐ Did not understand the procedures, or posted signs or signals.
- ☐ Deviated from the procedures, or applicable posted signs or signals.
- ☐ Did not signal their intentions before taking action or initiating an activity.
- ☐ Did not know where to obtain proper vehicle, equipment, tools, or materials.
- ☐ Did not know how to use vehicle, equipment, tools, or materials properly.
- ☐ Did not know where to obtain emergency equipment (such as eye wash station, fire extinguisher).
- ☐ Did not know how to properly use emergency equipment.
- ☐ Did not conduct pre-job inspection of vehicle, equipment, tools, or materials.
- ☐ Did not use proper vehicle, equipment, tools, or materials.
- ☐ Did not use vehicle, equipment, tools, or materials in proper manner.
- ☐ Did not operate vehicle, equipment, or tools at appropriate speed.
- ☐ Failed to maintain control of vehicle, tools equipment, or materials.
- ☐ Did not allow adequate space between vehicle, tools, equipment, or materials and others.
- ☐ Did not properly secure, store, or park vehicle, tools, equipment, or materials.
- ☐ Did not ask for assistance where needed.
- ☐ Did not know Personal Protective Equipment (PPE) requirements.
- ☐ Did not know how to use and/or maintain PPE.
- ☐ Did not use PPE properly.
- ☐ Was in wrong location (unauthorized).
- ☐ Did not recognize or report a hazardous condition.
- ☐ Did not pay attention to footing, walkways, or surroundings.
- ☐ Did not take proper position while performing job task or activity.
- ☐ Was distracted from activity being performed.
- ☐ Did not anticipate potential hazards in work environment.
- ☐ Did not anticipate changing conditions of work environment.
- ☐ Did not anticipate the actions of others.
- ☐ Was not familiar with environment where job or activity was to be performed.
- ☐ Other (Specify): _____

Appendix 51-02
Incident Investigation Process

(2) Management Systems & Processes

- ☐ Safety of employees/other people is not demonstrated through leadership and management systems.
- ☐ Verbal or written requirements for the job, task, or activity were not established (Policy, procedure, HASP, JSA).
- ☐ Procedures not communicated via training, meetings, or site discussions.
- ☐ Training of employees/other people was not provided (i.e., Orientation, Learning Management System, Safety Meetings, Tailgate Safety Meetings, etc.)
- ☐ The procedures did not anticipate the hazard(s) involved in the job, task, or activity (i.e., HASP, JSA).
- ☐ Project coordination requirements (procedures) between different work parties (Client, Contractors, Subcontractors) was not established.
- ☐ Project coordination requirements (procedures) between different work parties (Client, Contractors, Subcontractors) was not communicated to all parties.
- ☐ Permit system was not established for critical activities (confined space entry, hot work, work activities at Process Safety Management regulated facilities, etc.).
- ☐ Permit system for critical activities (confined space entry, hot work, work activities at Process Safety Management regulated facilities, etc.) was not communicated to all affected parties.
- ☐ Areas are not posted (signs) for specific PPE requirements.
- ☐ Adherence to, and enforcement of, established procedures and posted requirements is not periodically confirmed.
- ☐ Appropriate and adequate vehicles, tools, equipment, or materials were not provided.
- ☐ The appropriate & adequate PPE for the job, task, or activity was not specified (i.e., through the HASP, JSA).
- ☐ The appropriate & adequate PPE was not provided for job, task, or activity.
- ☐ Appropriate emergency equipment for job activity or work environment was not provided.
- ☐ Inspection procedures for emergency equipment were not established.
- ☐ Inspection procedures for vehicles, equipment, tools, or materials to detect hazardous conditions were not available.
- ☐ Potentially unsafe environmental conditions or hazards were not anticipated.
- ☐ There was a failure to detect, anticipate, or report hazardous conditions (i.e., Job Safety Analysis or JSA).
- ☐ There was a failure to detect or correct deviations from procedures.
- ☐ There was no review of hazards or procedures for unusual or infrequent tasks.
- ☐ There was no review of unusual or infrequently used equipment, tools, or materials.
- ☐ Management evaluation of Subcontractors was not performed.
- ☐ Management follow-up to evaluation of Subcontractors was not completed, where appropriate.
- ☐ Management responsibility and/or accountability is not adequately defined and understood.
- ☐ Management training and experience was insufficient to fulfill assigned responsibility & accountability.
- ☐ Hazardous condition was not recognized and reported.
- ☐ There was a failure to initiate corrective action for a known hazardous condition.
- ☐ Incentives were established (real/perceived) encouraging deviations from procedures.
- ☐ Other (Specify): _____

Appendix 51-02
Incident Investigation Process

(3) Equipment, Tools, or Materials

- ☐ Defects in vehicle, equipment, tools, or materials contributed to hazardous condition.
- ☐ Correct vehicles, equipment, tools, or materials were not readily available.
- ☐ Correct vehicles, equipment, tools, or materials were not used.
- ☐ Substitute vehicles, equipment, tools, or materials were used.
- ☐ Design of vehicles, equipment, tools, or materials contributed to or created operator stress or error.
- ☐ Location of vehicles, equipment, tools, or materials contributed to or created a hazardous condition.
- ☐ Emergency equipment specified for job activity or work area was not operational.
- ☐ Appropriate & adequate equipment, tools, or materials for job, task, or activity were not specified.
- ☐ Appropriate & adequate equipment, tools, or materials were not provided for job, task, or activity.
- ☐ Vehicle, tools, equipment, or materials failed during operation.
- ☐ Emergency equipment failed during use.
- ☐ PPE failed during use.
- ☐ Other (Specify): _____

(4) Environment

- ☐ The environment where job, task, or activity was performed was not familiar to employee/other people.
- ☐ A hazardous environmental condition was not recognized.
- ☐ A hazardous environmental condition was not reported.
- ☐ A hazardous environmental condition was created by location and/or position of vehicle, equipment, tools, or materials.
- ☐ Sufficient work space was not available.
- ☐ Adequate aisles, walkways, and exits were not available for emergency response.
- ☐ Adequate space was not available at and around emergency shut-off switches or controls.
- ☐ Appropriate signs were not posted to indicate emergency routes or emergency equipment.
- ☐ Emergency lights and exit signage were not available and/or not operational during power outage.
- ☐ Emergency routes were not designed to minimize close proximity to hazards.
- ☐ Environmental conditions at the time served as contributor to incident (examples include: noise, illumination, air contaminant, temperature extremes, ventilation, weather conditions, radiation, vibration, etc.)
- ☐ Environmental conditions changed during the job activity or task.
- ☐ Job activities were not adjusted or modified for changing environmental conditions.
- ☐ Other (Specify): _____

Appendix 51-02
Incident Investigation Process

Step No. 2: Evaluate & Finalize Contributing Factors

After carefully evaluating the Contributing Factors and establishing those that had a direct impact upon the incident, transfer them to the box below. Many of the Contributing Factors statements apply to more than one scenario and are generically worded. Therefore, you should reword each Contributing Factor to be specific to the actual event that occurred (e.g., "Employee deviated from job procedures" rather than "Employee deviated from the procedures, or posted signs or signals"). During the initial stages of your investigation, you may have answered some questions that eliminate one or more Contributing Factors. For example, if employee says he was not trained for "X", but you have records showing he was, this contributing factor may be eliminated.

Final Contributing Factors	
(1)	
(2)	
(3)	
(4)	
(5)	
(6)	
(7)	

Step No. 3: Identify Root Causes

In this step, you "Drill-Down" for each final Contributing Factor/Conclusion to identify underlying causes for breakdowns or failures in processes, procedures, systems, or behaviors. Your primary tool in the drill down process is to ask the question "WHY"? It is often necessary to ask this question three or more times before the Root Cause(s) of a particular Contributing Factor can be determined. Each time the question is asked it should reveal a deeper underlying cause. You know you have reached the "Root Cause" when you have identified a fundamental breakdown in process, procedure, system or behavior that, when corrected, will prevent the same or a similar event from happening in the future. If not, then you may not have reached the "Root Causes" and may need to continue the drill down process. Repeat this process for each final Contributing Factor until all Root Causes have been determined.

Root Causes:


1. _____
2. _____
3. _____

Step No. 4: Develop an Action Plan

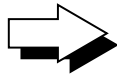
Based upon your objective and factual Root Causes, determine what "Corrective Actions" should be taken to prevent a similar incident in the future. You know you have established an effective Corrective Action if it will eliminate a Root Cause. Decide who is to complete each Corrective Action and when is it to be completed. Ensure that actions receive appropriate attention and are completed. If target date is not met, find out why. Be supportive but hold people accountable.

Corrective Actions	Assigned to (Name)	Target Completion Date
1.		
2.		
3.		
4.		

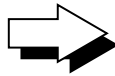
Investigation Completed By: _____ Date: _____

	Employee Health & Safety Policy Manual	Policy Section #:	51
		Page:	1 of 1
	Subject: Appendix 51-03(a)	Revision:	01
	Incident Investigation Process Worksheet	Issue Date:	04-03-2008

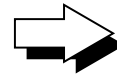
**(1) Identify All
Potential
Contributing
Factors**



**(2) Evaluate &
Finalize
Contributing
Factors**

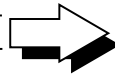


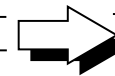
**(3) Identify the
“Root Cause(s)”**



**(4) Take
Action**

Employees/Other People
Management Systems & Processes
Equipment, Tools, and Materials
Environment





Through evaluation process, finalize the list of Contributing Factors to just those that were directly involved in incident.

Find causes for breakdown or failures in processes, procedures, systems, or behaviors

[Ask WHY? 3 times]

1. Identify specific action to take;
2. Assign that action;
3. Provide completion date for action.

Question – Will this action keep similar incidents from occurring in future? If not, you don't have Root Cause.

Initially, identify (check) all potential Contributing Factors in each category.



Injury Assessment Hot-Line:

1-800-756-1130

Call 24 Hours a Day / 7 Days a Week